ORDER NO. SD82032141C8

Service Manual

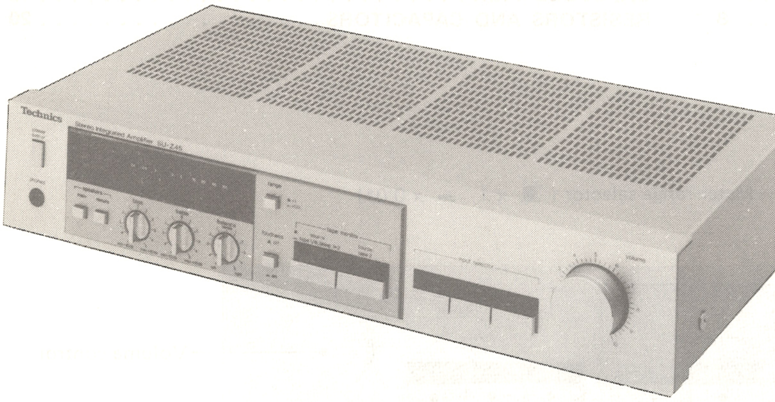
Stereo Integrated Amplifier

SU-Z45

[E],[EG],[EK],[EF],[EH],
[EB],[Ei],[XA],[XL]

SU-Z45(K)

[E],[EG],[EH],[Ei]



Areas

- * [E] is available in Scandinavia and Switzerland.
- * [EG] is available in F.R. Germany.
- * [EK] is available in United Kingdom.
- * [EF] is available in France.
- * [EH] is available in Holland.
- * [EB] is available in Belgium.
- * [Ei] is available in Italy.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XL] is available in Australia.

* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	2 × 35W (4Ω)
both channels driven	2 × 35W (8Ω)
40 Hz~16 kHz continuous power output	2 × 35W (4Ω)
both channels driven	2 × 35W (8Ω)
1 kHz continuous power output	2 × 40W (4Ω)
both channels driven	2 × 40W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.05% (4Ω), 0.03% (8Ω)
rated power at 40 Hz~16 kHz	0.05% (4Ω), 0.03% (8Ω)
rated power at 1 kHz	0.007% (4Ω), 0.005% (8Ω)
half power at 20 Hz~20 kHz	0.03% (8Ω)
half power at 1 kHz	0.005% (8Ω)
−26 dB power at 1 kHz	0.01% (4Ω)
50 mW power at 1 kHz	0.01% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.05%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.03%
Power bandwidth	
both channels driven, −3 dB	10 Hz~25 kHz (4Ω) 10 Hz~25 kHz (8Ω)
Residual hum and noise	0.6 mV
Damping factor	20 (4Ω), 40 (8Ω)
Input sensitivity and impedance	
PHONO	2.5 mV/47kΩ
TUNER, AUX	150 mV/22kΩ
TAPE 1	150 mV/22kΩ
TAPE 2	150 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
TUNER, AUX, TAPE	5 Hz~80 kHz (−3 dB)
S/N	
rated power (4Ω)	
PHONO	75 dB (IHF, A: 81 dB)
TUNER, AUX, TAPE	86 dB (IHF, A: 97 dB)
−26 dB power (4Ω)	
PHONO/TUNER, AUX, TAPE	65 dB/65 dB
50 mW power (4Ω)	
PHONO/TUNER, AUX, TAPE	62 dB/62 dB
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage	
REC OUT	150 mV
Channel balance, AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX 1 kHz	50 dB
Headphones output level and impedance	390 mV/330Ω
Load impedance	
MAIN or REMOTE/MAIN and REMOTE	4Ω~16Ω/8Ω~16Ω

■ GENERAL

Power consumption	310W
Power supply	AC 50 Hz/60 Hz, 220V (For continental Europe) AC 50 Hz/60 Hz, 240V (For United Kingdom and Australia) AC 50 Hz/60 Hz, 110V/120V/220V/240V (For others)
Dimensions (W×H×D)	430 × 86 × 288 mm (16-15/16" × 3-3/8" × 11-11/32")
Weight	5.8 kg (12.8 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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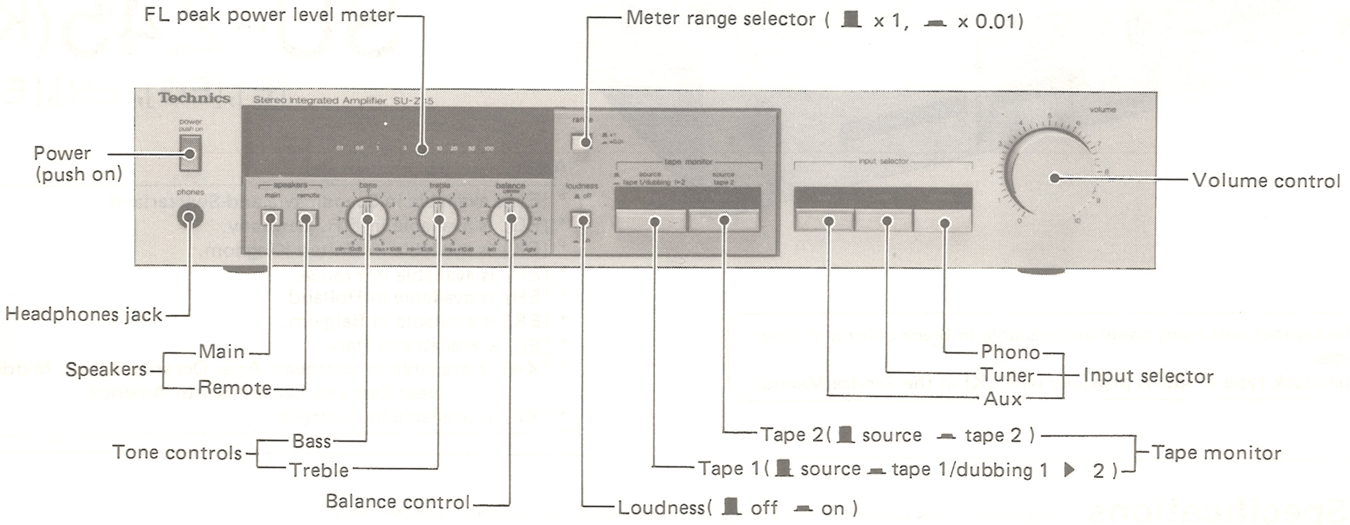
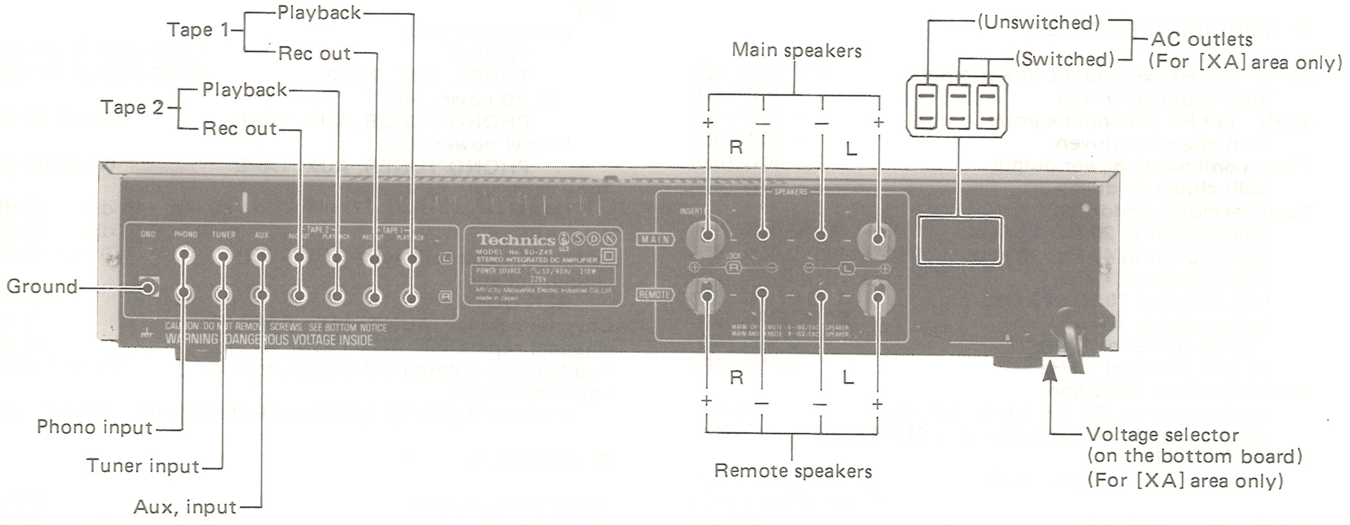
LOCATION OF CONTROLS


FL peak power level meter
Meter range selector (▮ x 1, ▬ x 0.01)
Power (push on)
Volume control
Headphones jack
Speakers
Main
Remote
Tone controls
Bass
Treble
Balance control
Phono
Tuner
Aux
Input selector
Tape 2(▮ source ▬ tape 2)
Tape 1(▮ source ▬ tape 1/dubbing 1 ▶ 2)
Tape monitor
Loudness(▮ off ▬ on)
Technics
Stereo Integrated Amplifier SU-Z45
power push on
phones
speakers main remote
bass
treble
balance
range
loudness
tape monitor
source tape 1/dubbing 1▶2
source tape 2
input selector
volume


Tape 1
Playback
Rec out
Tape 2
Playback
Rec out
Main speakers
(Unswitched)
(Switched)
AC outlets (For [XA] area only)
+
−
R
L
Ground
Phono input
Tuner input
Aux, input
Remote speakers
Voltage selector (on the bottom board) (For [XA] area only)
GND
PHONO
TUNER
AUX
TAPE 2
TAPE 1
REC OUT
PLAYBACK
L
R
Technics
MODEL No. SU-Z45
STEREO INTEGRATED DC AMPLIFIER
POWER SOURCE ∿50/60Hz 310W 220V
Made in Japan
MAIN
REMOTE
SPEAKERS
CAUTION: DO NOT REMOVE SCREWS. SEE BOTTOM NOTICE
WARNING: DANGEROUS VOLTAGE INSIDE.

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and the replacement parts list.

* 220V (50/60Hz) for continental Europe.
* 240V (50/60Hz) for United Kingdom and Australia.
* 110V/120V/220V/240V (50/60Hz) for other areas.
— [XA area] for other areas is provided with voltage selector and AC outlets.
* Phono input capacitance is about 150pF.

ORDER NO. SD82060101P8

Parts Change Notice

File this bulletin with
your Service manual

MODEL NO: SU-Z45 [E],[EG],[EK],[EF],[EH],[EB],[Ei],[XA],[XL]
SU-Z45(K) [E],[EG],[EH],[Ei]
ORDER NO: SD82032141C8

FILE No. SU-Z45 [E]-1

Subject: Change of Parts Number.

Please revise the original parts list in the Service Manual to conform to the change(s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

❶ Reason for Change
1 Improve performance
2 Change of material
3 Change of dimension
4 To meet approved specification
5 Standardization
6 Addition
7 Deletion
8 Correction
9 Other ( )

❷ Interchangeability Code

	Parts	Set Production	
A	Original New	Early Late	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
C	Original New	Early Late	New parts only may be used in early or late production sets. Stock new parts.
D	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.

Part Number

❶	❷	Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions
8	—	F1	XBA2C10TRO	XBA2C20TRO	Fuse, 250V, T2A
8	—	F2 [XA] only	XBA2C20TRO	XBA2C10TRO	Fuse, 250V, T1A

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan
Printed in Japan
82060850 ® NT

ORDER NO. SD82062211C9

Service Manual

Stereo Integrated Amplifier

SU-Z45

[XV], [PA], [PE], [PC]

SU-Z45(K)

[XA] , [PC]

Areas

- * [PA] is available in fer East PX.
- * [PE] is available in European Military.
- * [PC] is available in European Audio Club.
- * [XV] is available in Venezuela.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

* Please use this manual together with the service manual for Model No. SU-Z45 [E, EG , EK, EF, EH, EB, Ei, XA and XL areas] , Order No. SD82032141C8.
* Mentioned in this parts list are only those changed in Model No. SU-Z45 for destination [E] area.

CHANGES

■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.		Part Name & Description
	SU-Z45 〔E〕 ➡	SU-Z45 〔PA,PE,PC,XA,XV〕	
Electronic Parts			
T1	SLT5M219	SLT5M223	Transformer, Power
F2	Addition	XBA2C10TRO	Fuse, T1A (250V)
S8	ESB822S	ESB90227S	Switch, Power
S9	Addition	ESE37219	Switch, Voltage Selector
Cabinet and Chassis Parts			
2 ○	SYW573	SYW573—2	Front Panel Ass'y (Silver)
Ⓚ	SYW573—1	SYW573—3	Front Panel Ass'y (Black)
13	SMX609	SMX453	Shield Cover
13	SJT347	Deletion	Holder, Fuse
21	Addition	SJT347	Holder, Fuse
26	SJA88	SJA111 〔XA,XV,PC〕 only	AC Cord
		RJA52Z 〔PA,PE〕 only	

Ref. No.	Change of Part No.		Part Name & Description
	SU-Z45 〔E〕 ➡	SU-Z45 〔PA,PE,PC,XA,XV〕	
28	SGP3170B	SGP3170—1A 〔XA,XV,PC〕 only	Rear Panel
		SGP3170—3A 〔PA,PE〕 only	
29	Addition	SJS601—2	Socket, AC Outlet
Accessories			
A1	Addition	SJP5213—1 〔XA,XV,PC〕 only	Plug Adapter (C→U)
A2	Addition	SJP5215 〔XA,XV,PC〕 only	Plug Adapter (U→B)
A3	Addition	RJP120ZBS 〔PA,PE〕 only	Plug Adapter
A4	SQF11213	SQF11221 〔XA,PC〕 only	Instructions Book
		SQF11393 〔XV〕 only	Instructions Book
		SQF11223 〔PA,PE〕 only	Instructions Book

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quantity per set.
6. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
7. Parts other than Ⓚ - and ○- marked are used for both black ans silver types.

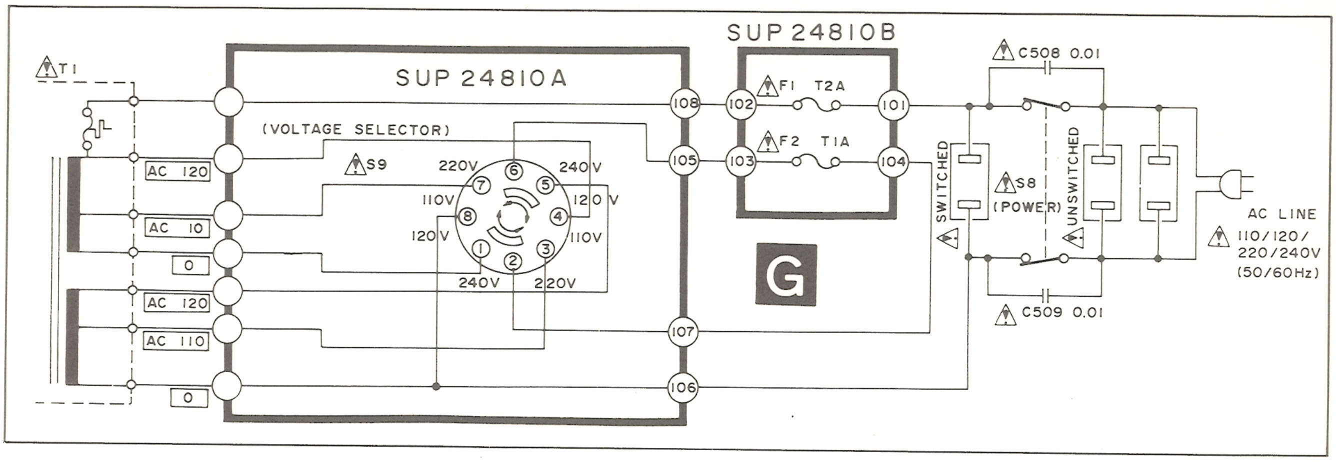
Black type model No. SU-Z45 (K)

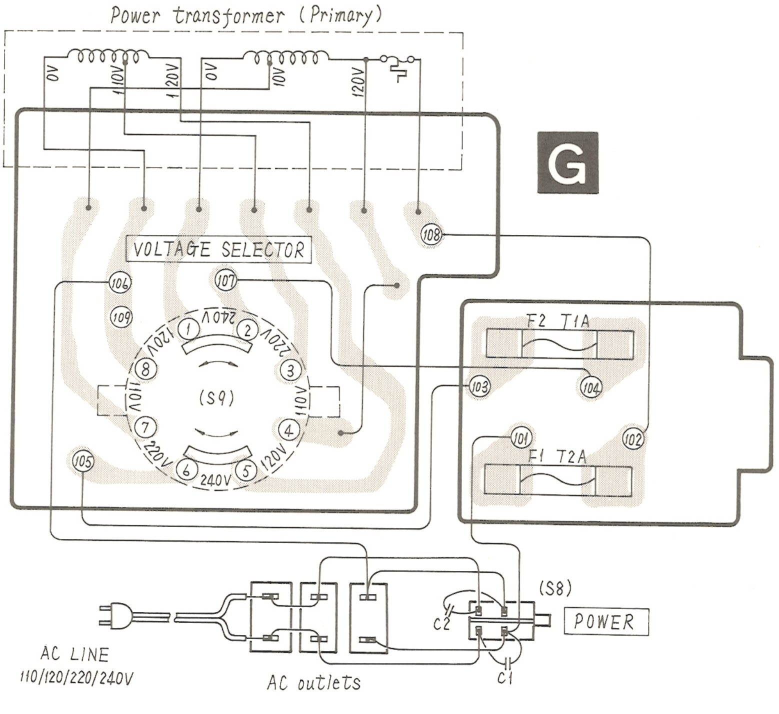
Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM2043DD	Epualizer
(IC21)×2	AN7060F	Voltage AMP.
IC301	SVISTK2038B	Power AMP.
IC601, 602	SVIHA12010	Level Comparator
IC603	SVITA7318P	Meter AMP.
TRANSISTORS		
(Q20)×2	2SA1123—R	Pre Drive
Q41～43	2SA1015—Y	Switching/Hold
Q44	2SC1815—Y	Hold
Q401 **S**	2SA722—S	LED Drive
Q601 **S**	2SC1384AR	Regulator
DIODES		
(D21)×2, 41, 42 **S**	MA162A	Switching
D301	SVDMZ306A	6V, Zener
D401～404 ⚠	SVDS2V20	Rectifier
D405, 406 **S**	MA1150A	15V, Zener
D407, 413 414 ⚠ **S**	SVDSR1K2	Rectifier
D408～410	LN31GCPHL	Light Emitting Diode
D411, 412	LN41YCP	Light Emitting Diode
D601	MA1200	20V, Zener
COILS		
L301, 302	SLQY15G—30	Choke
TRANSFORMERS		
T1 ⚠	SLT5M223	Power Source
VARIABLE RESISTORS		
VR201	EWJG2A052B15	Volume, 100kΩ (B)
VR202	EWHFKA004G15	Balance, 100kΩ (G)
VR301	EWCX9A005012	Treble
VR302	EWCXAA005C15	Bass, 100kΩ (C)
VR601, 602	EVNK6AA00B23	FL Level Meter, 2kΩ (B)
THERMISTORS		
TH301, 302	RRT104	100kΩ
COMPONENT COMBINATION		
Z401	SXRFS203ZSM	(0.01μF)×2
FLUORESCENT DISPLAY TUBE		
FL	SADBG89Z	Power Meter
FUSES		
F1 ⚠	XBA2C20TRO	250V, T2A
F2 ⚠	XBA2C10TRO	250V, T1A
SWITCHES		
S1	SSH3033	Input Selector
S2, 3, 4	SSH3043	Tape Monitor, Loudness
S5, 6	SSH2017	Speaker (Main/Remote)
S7	SSH1053	Range Selector
S8 ⚠	ESB90227S	Power Source
S9 ⚠	ESE37219	Voltage Selector

Ref. No.	Part No.	Description & Pcs
CABINET and CHASSIS PARTS		
1	SBN1089	Knob, Bass, Treble and Balance (3)
2 ○	SYW573—2	Front Panel Ass'y (1) (Silver)
2 Ⓚ	SYW573—3	Front Panel Ass'y (1) (Black)
3	SBN1125	Knob, Volume (1)
4 ○	SGXUZ45E	Holder, Input Selector (1) (Silver)
4 Ⓚ	SGXUZ45KE	Holder, Input Selector (1) (Black)
5 ○	SGXUZ45E1	Holder, Tape (Silver) (1)
5 Ⓚ	SGXUZ45KE1	Holder, Tape (Black) (1)
6	SBC443	Button, Input Selector (3)
7	SBC445	Button, Tape Monitor (2)
8	SBC441	Button, Speaker, (4) Range, Loudness
9 ○	SDU131	Filter, FL (Silver) (1)
9 Ⓚ	SDU131—1	Filter, FL (Black) (1)
10	SGX7327	Holder, FL (1)
11	SBC337—1	Button, Power Source (1)
12	SMX617	Shield Cover (1)
13	SMX453	Shield Cover (1)
15	SJJ71B	Jack, Headphone (1)
16 ○	SKC1050S1	Cabinet (Silver) (1)
16 Ⓚ	SKC1050B1	Cabinet (Black) (1)
17	SUS275	Bracket (1)
18	SMP323—1	Holder, LED (Tape) (1)
19	SMP321—1	Holder, LED (Input) (1)
20	SMX365	Shield Cover (1)
21	SJT347	Holder, Fuse (4)
23	SML129	Bracket, Power (1) Trasformer
24	SMX615	Shield Cover (1)
25	SJF4815	Terminal Board (1)
26 ⚠ 〔XA, XV, PC〕	SJA111	AC Cord (1)
26 ⚠ **S** 〔PA, PE〕	RJA52Z	AC Cord (1)
27	SHR127	Bushing, AC Cord (1)
28 〔XA, XV, PC〕	SGP3170—1A	Rear Panel (1)
28 〔PA, PE〕	SGP3170—3A	Rear Panel (1)
29 ⚠	SJS601—2	Socket (1)
30	SJF3051—3N	Terminal Board (1)
31	SHR401—1	Look Pin (1)
32	SKUUZ45E	Bottom Board (1)
33	SKL249	Foot (4)
SCREWS		
N1	XTBS3+8BFYR1	Tapping, with Detent (3)
N2 **S**	XTB3+8BFN	Tapping, ⊕3×8 (5)
N3 **S**	XSN3+6S	⊕3×6 (4)
N4 ○	SNE2095—2	Tapping (2)
N4 Ⓚ	SNE2095—3	Tapping (2)

Ref. No.	Part No.	Description & Pcs
N5 **S**	XTB4+10BFZ	Tapping, ⊕×10 (4)
N6 **S**	XSN3+12BNS	⊕3×12 (2)
N7 **S**	XTN3+8B	Tapping, ⊕3×8 (1)
N9 **S** ○	XTB3+8BFN	Tapping, ⊕3×8 (2)
N9 **S** Ⓚ	XTB3+8BFZ	Tapping, ⊕3×8 (2)
N10	XTBS3+8BFZ1	Tapping with Detent (10)
N12	XTBS3+8BFYR1	Tapping with Detent (2)
N13 **S**	XTN3+10B	Tapping, ⊕3×10 (4)
WASHERS		
N14 **S**	XWA38	Spring, ϕ3 (6)
N15 **S**	XWG3	Plain, ϕ3 (7)
N17 **S**	XWC3B	External Toothed Lock ϕ3 (2)
NUTS		
N18	SNE4021	Nut, with Plain (4)
N19 **S**	XNS12	ϕ12 (1)
ACCESSORIES		
A1 ⚠ 〔XA, XV, PC〕	SJP5213—1	Plug Adapter, (C→U) (1)
A2 ⚠ 〔XA, XV, PC〕	SJP5215	Plug Adapter, (U→B) (1)
A3 ⚠ 〔PA, PE〕	RJP120ZBS	Plug Adapter (1)
A4 〔XA, PC〕	SQF11221	Instructions Book (1)
A4 〔XV〕	SQF11393	Instructions Book (1)
A4 〔PA, PE〕	SQF11223	Instructions Book (1)
PACKING PARTS		
P1 ○	SPP699	Polyethylene Bag (Silver) (1)
P1 Ⓚ	SPP649	Polyethylene Bag (Black) (1)
P2	SPS3661—2	Pad, Left Side (1)
P3	SPS3663	Pad, Right Side (1)
P4 ○	SPG3895	Carton Box (Silver) (1)
P4 Ⓚ	SPG3995	Carton Box (Black) (1)

POWER SOURCE CIRCUITRY


T1
SUP 24810A
(VOLTAGE SELECTOR)
S9
SUP 24810B
F1 T2A
F2 T1A
C508 0.01
C509 0.01
SWITCHED
UNSWITCHED
S8
(POWER)
AC LINE
110/120/
220/240V
(50/60Hz)
G
AC 120
AC 10
0
AC 120
AC 110
0
220V
240V
110V
120V
120V
110V
240V
220V
1
2
3
4
5
6
7
8
108
105
107
106
102
103
101
104


Power transformer (Primary)
0V
110V
120V
0V
10V
120V
G
VOLTAGE SELECTOR
108
106
107
109
105
(S9)
240V
220V
120V
110V
220V
240V
120V
110V
1
2
3
4
5
6
7
8
F2 T1A
F1 T2A
103
104
101
102
(S8)
POWER
C2
C1
AC LINE
110/120/220/240V
AC outlets

ORDER NO. SD82032141C8–A

Stereo Integrated Amplifier SU-Z45/SU-Z45(K)

This booklet contains the specifications and adjusting procedures for SU-Z45, written in Germany, Franch and Spanish, and the circuits to be changed according to the areas.
File this manual together with the SU-Z45 service manual (Order No. SD82032141C8).

DEUTSCH

TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 35W (4 Ω), 2 × 35W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 35W (4 Ω), 2 × 35W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 40W (4 Ω), 2 × 40W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,05% (4 Ω), 0,03% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,05% (4 Ω), 0,03% (8 Ω)
Nennleistung bei 1 kHz	0,007% (4 Ω), 0,005% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,03% (8 Ω)
halbe Nennleistung bei 1 kHz	0,005% (8 Ω)
−26 dB Leistung bei 1 kHz	0,01% (4 Ω)
50 mW Leistung bei 1 kHz	0,01% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,05%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,03%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei −3 dB	10 Hz ~ 25 kHz (4 Ω), 10 Hz ~ 25 kHz (8 Ω)
Restbrumm und Geräusch	0,6 mV
Dämpfungsfaktor	20 (4 Ω), 40 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 kΩ
Tuner, Aux	150 mV/22 kΩ
Tape 1 (TAPE 1)	150 mV/22 kΩ
Tape 2 (TAPE 2)	150 mV/22 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	150 mV
Frequenzgang	
Phono	RIAA-Standardkurve, ±0,8 dB (30 Hz ~ 15 kHz)
Tuner, Aux, Tape	5 Hz ~ 80 kHz (−3 dB)
Geräuschabstand	
Nennleistung (4 Ω)	
Phono	75 dB (nach IHF, A: 81 dB)
Tuner, Aux, Tape	86 dB (nach IHF, A: 97 dB)
−26 dB Leistung (4 Ω)	
Phono	65 dB
Tuner, Aux, Tape	65 dB
50 mW Leistung (4 Ω)	
Phono	62 dB
Tuner, Aux, Tape	62 dB
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ −10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ −10 dB
Gehörrichtige Lautstärkekorrektur (Loudness)	
(bei −30 dB Ausgangsleistung)	50 Hz, +9 dB
Ausgangsspannung und -impedanz	
Aufnahmeausgang (REC OUT)	150 mV
Kanalabweichung (Aux, 250 Hz ~ 6.300 Hz)	±1 dB
Übersprechdämpfung (Aux, 1 kHz)	50 dB
Kopfhörerpegel und -impedanz	390 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

ALLGEMEINE DATEN

Leistungsaufnahme	310 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V (Für Kontinentaleuropa)
	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V (Für andere Länder)
Abmessungen (B×H×T)	430 × 86 × 288 mm
Gewicht	5,8 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

JUSTIERUNGEN

Spitzenwertanzeigen

Einstellung:

- Einen Niederfrequenzoszillator an die Eingangsklemme des Tuners schließen und parallel zu 8-ohm Belastungswiderstand den elektronischen Wechselstrom-Voltmeter an die Lautsprecherklemme schließen.
- 1 kHz Signal aus dem Niederfrequenzoszillator in das Gerät speisen.
- Lautstärkeregler auf den minimalen Punkt einstellen.

Gegenstand	Stellung des Meterbereichswählers	Zu justierender widerstand	Justierung
Spitzenwertanzeigen	Bereichswähler auf X0.01	VR601 (Linker Kanal) VR602 (Rechter K.)	1. Den Eingangspegel so justieren, daß der Wechselstrom-Voltmeter 2,0V anzeigt. 2. Die halbfest eingestellten Widerstände VR601 (linker Kanal) und VR602 (rechter Kanal) so einstellen, daß das 50W -Segment des Fluoreszenz-Aussteuerungsinstru-mentes schwach aufleuchtet. (Abb. 14)

FRANÇAIS

CARACTERISTIQUES

(Sujet à changement sans préaris.)

(DIN 45 500)

SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit	2 × 35W (4Ω) 2 × 35W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 35W (4Ω) 2 × 35W (8Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 40W (4Ω) 2 × 40W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,05% (4Ω) 0,03% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,05% (4Ω) 0,03% (8Ω)
à puissance nominale (1 kHz)	0,007% (4Ω)/0,005% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,03% (8Ω)
à demi-puissance (1 kHz)	0,005% (8Ω)
puissance de −26 dB à 1 kHz	0,01% (4Ω)
puissance de 50 mW à 1 kHz	0,01% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,05%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,03%
Réponse de fréquences	
les deux canaux en circuit, −3 dB	10 Hz~25 kHz (4Ω) 10 Hz~25 kHz (8Ω)
Bruit et ronflement résiduels	0,6 mV
Coefficient d'amortissement	20 (4Ω), 40 (8Ω)
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
SYNTONISATEUR, AUX (TUNER, AUX)	150 mV/22kΩ
BANDE 1 (TAPE 1)	150 mV/22kΩ
BANDE 2 (TAPE 2)	150 mV/22kΩ
PHONO (tension d'entrée maximum, 1 kHz RMS)	150 mV
Réponse de fréquence	
PHONO	Courbe nominale RIAA/±0,8 dB (30 Hz~15 kHz)
SYNTONISATEUR, AUX, BANDE (TUNER, AUX, TAPE)	5 Hz~80 kHz (−3 dB)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Compensateur physiologique (volume à −30 dB)	50 Hz, +9 dB
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	75 dB (IHF, A: 81 dB)
SYNTONISATEUR, AUX, BANDE (TUNER, AUX, TAPE)	86 dB (IHF, A: 97 dB)
puissance de −26 dB (4Ω)	
PHONO	65 dB
SYNTONISATEUR, AUX, BANDE (TUNER, AUX, TAPE)	65 dB
puissance de 50 mW (4Ω)	
PHONO	62 dB
SYNTONISATEUR, AUX, BANDE (TUNER, AUX, TAPE)	62 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT (REC OUT)	150 mV
Equilibrage des canaux, AUX 250 Hz~6.300 Hz	±1 dB
Séparation des canaux, AUX 1 kHz	50 dB
Niveau de sortie des casques et impédance	390 mV/330Ω
Impédance de charge	
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	4Ω~16Ω
PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)	8Ω~16Ω

DIVERS

Consommation	310W
Alimentation	CA 50 Hz/60 Hz, 220V (Pour l'Europe) CA 50 Hz/60 Hz, 110V/120V/220V/240V (Autres)
Dimensions (L×H×Pr)	430 × 86 × 288 mm
Poids	5,8 kg

Nota:
La Société NATIONAL-PANASONIC-FRANCE, importateur du matériel MATSUSHITA-ELECTRIC déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. (arrêté 14 Janvier 1980).

Remarque:
1On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).

REGLAGES

Indicateurs de puissance de crête fluorescents

Réglage:

- Brancher un oscillateur à basse fréquence à la borne de sortie du tuner et une résistance de charge de 8 ohms et un voltmétre électronique à la borne de l'enceinte.
- Par l'oscillateur à basse fréquence, appliquer un signal de 1 kHz à l'appareil.
- Régler le volume du son au maximum.

Article	Position du commutateur de sélection de la gamme du compteur	VR à régler	Réglage
Indicateurs de puissance de crête fluorescents	Commutateur de gamme X0,01	VR601 (CG) VR602 (CD)	1. Régler le niveau de sortie de telle sorte que la voltmétre CA indique 2,0V. 2. Régler les résistances variables semi-fixes VR601 (canal de gauche) et VR602 (canal de droite), de façon à ce que le segment de 50W de l'appareil de mesure FL s'éclaire faiblement. (Fig. 14)

ORDER NO. SD82060101P8

Parts Change Notice

File this bulletin with
your Service manual

MODEL NO: SU-Z45 [E],[EG],[EK],[EF],[EH],[EB],[Ei],[XA],[XL]
SU-Z45(K) [E],[EG],[EH],[Ei]
ORDER NO: SD82032141C8

FILE No. SU-Z45 [E]-1

Subject: Change of Parts Number.

Please revise the original parts list in the Service Manual to conform to the change(s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

❶ Reason for Change

1 Improve performance
2 Change of material
3 Change of dimension
4 To meet approved specification
5 Standardization
6 Addition
7 Deletion
8 Correction
9 Other ( )

❷ Interchangeability Code

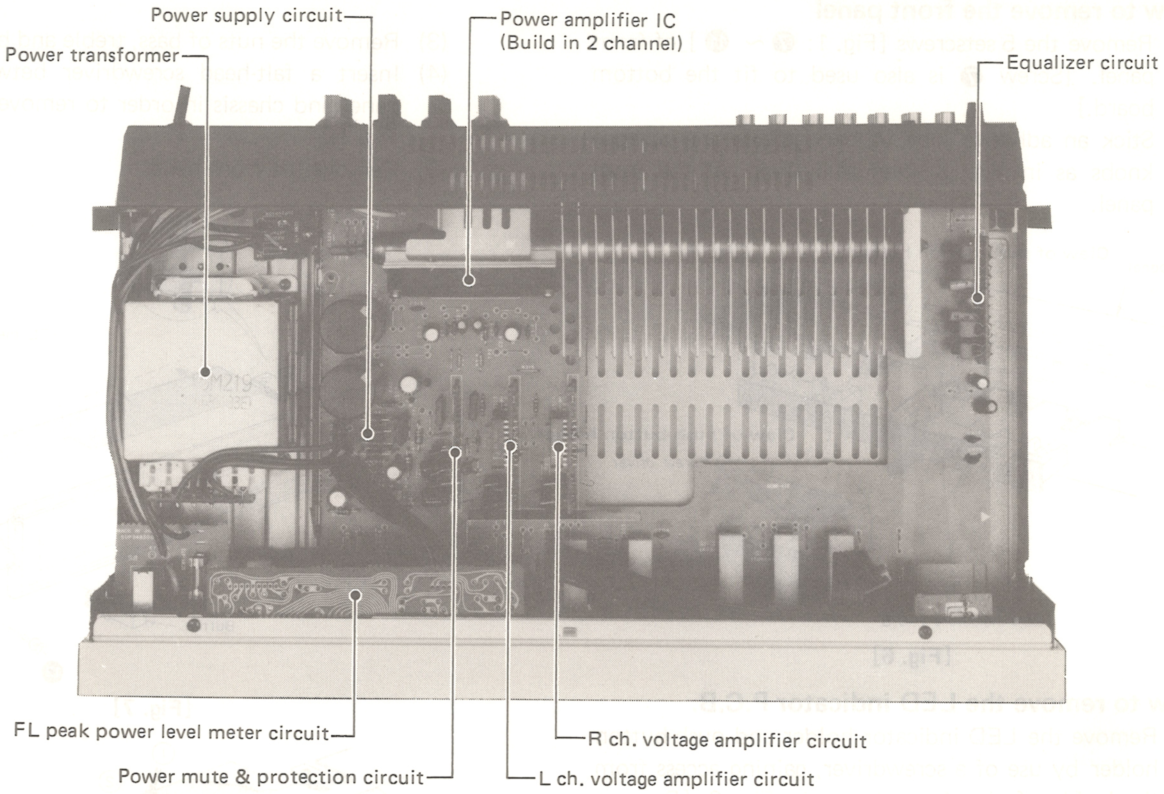
	Parts	Set Production	
A	Original New	Early Late	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
C	Original New	Early Late	New parts only may be used in early or late production sets. Stock new parts.
D	Original New	Early Late	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.

Part Number

❶	❷	Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions
8	—	F1	XBA2C10TRO	XBA2C20TRO	Fuse, 250V, T2A
8	—	F2 [XA] only	XBA2C20TRO	XBA2C10TRO	Fuse, 250V, T1A
☐	☐				
☐	☐				
☐	☐				
☐	☐				
☐	☐				

Technics

Matsushita Electric Trading Co., Ltd.
P.O Box 288, Central Osaka Japan
Printed in Japan
82060850 ®NT


Power supply circuit
Power transformer
Power amplifier IC
(Build in 2 channel)
Equalizer circuit
FL peak power level meter circuit
Power mute & protection circuit
R ch. voltage amplifier circuit
L ch. voltage amplifier circuit

PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

BEFORE REPAIR AND ADJUSTMENT

Turn off the power supply and short-circuit both ends of power supply condensers (401, C402, 6800μF) at resistance (about 10Ω, 5W) in order to discharge the charged voltage. Avoid short-circuit with a screwdriver or the like, otherwise the transistors or diodes may break down.

Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a voltage regulator to make sure that the current consumed is free of abnormality. The current consumed at 60Hz/50Hz in no-signal mode is shown below with respect to supply voltage 110V/120V/220V/240V.

Power supply voltage		AC 110V	AC 120V	AC 220V	AC 240V
Current consumed	50Hz	210 ~ 310mA	190 ~ 290mA	100 ~ 200mA	90 ~ 190mA
	60Hz	200 ~ 300mA	180 ~ 280mA	90 ~ 190mA	80 ~ 180mA

TECHNICAL GUIDE

The power amplifier IC is provided with a protection circuit.

1. Muting (shock noise prevention) with power switch ON

(1) When power supply is turned ON, the voltage at point Ⓐ becomes negative due to power from D403 and D404, causing Q42 to turn ON.
(2) After lapse a few seconds, the charge voltage of C41 and C42 rises due to power from D414, then the voltage at point Ⓐ rises as well.
(3) Q42 turns OFF, and subsequently Q41 turns ON.
(4) Negative voltage is applied to IC21 and IC301, then the operation begins.

*The signal is applied to the power amplifier a few seconds later so that shock noise can be prevented.

2. Muting (shock noise prevention) with power switch OFF

(1) When power supply is turned OFF, the positive voltage at point Ⓐ is quickly discharged by D42, and then negative voltage remains.
(2) The negative voltage causes Q42 to turn ON, then Q41 turns OFF.

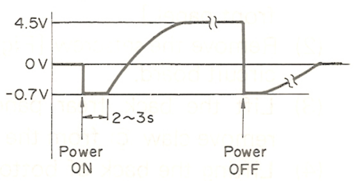
*The signal is cut off on the input side while the operation voltage of power amplifier still remains, thus preventing shock noise.

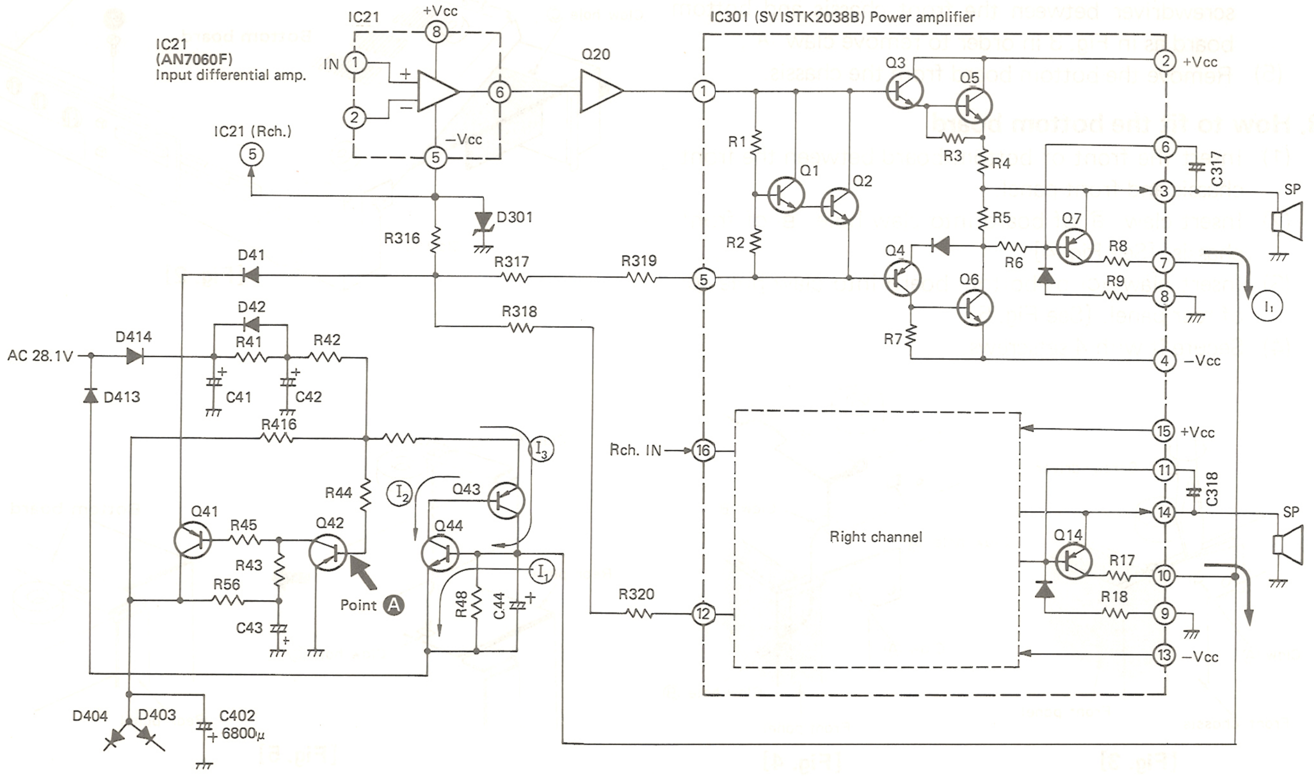
3. When over-load is connected to speaker terminals

(1) Due to over-load connected to the speaker terminal or excessive output, voltage is generated in R5 causing Q7 in power amplifier to turn ON which should be usually OFF.
(2) With Q7 ON, (I_1) flows causing Q44 to turn ON.
(3) With Q44 ON, (I_2) flows causing Q43 to turn ON.
(4) With Q43 ON, (I_3) flows and Q44 ON is hold.
(5) The holding circuit functions to decrease the voltage at point Ⓐ, causing Q42 ON and Q41 OFF.

If no output is delivered due to the holding circuit, turn OFF the power supply to check the cause. After lapse a few minutes, turn ON the power supply. (The holdng circuit will not be reset soon.)

Voltage of point Ⓐ



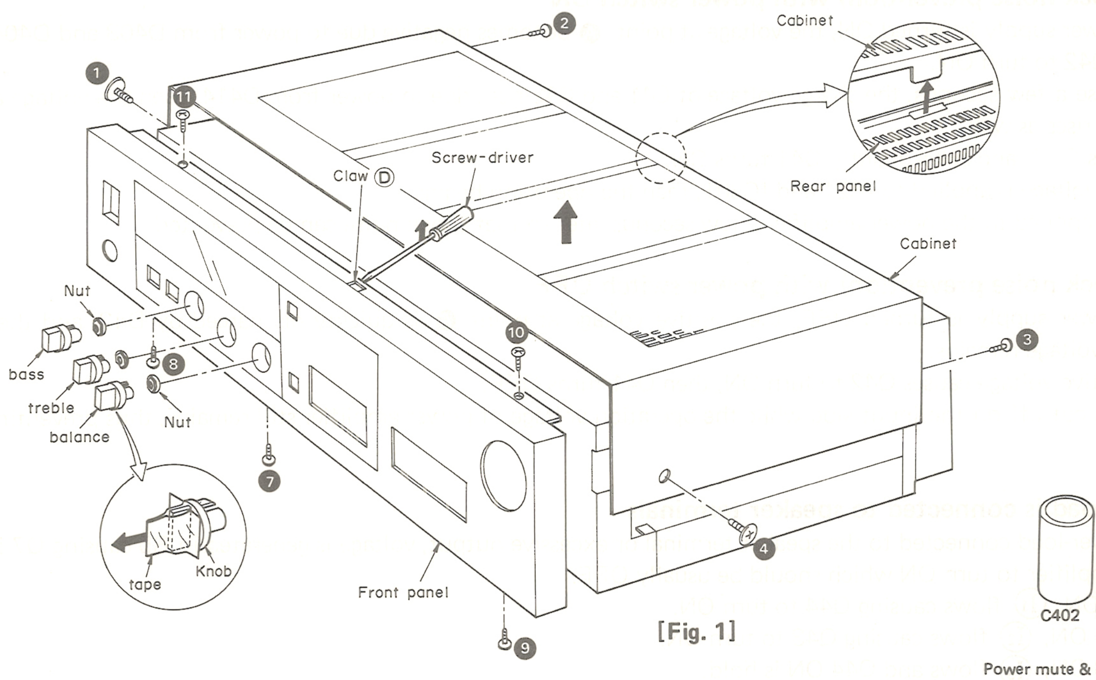

IC21
+Vcc
IC21
(AN7060F)
Input differential amp.
IN
−Vcc
IC21 (Rch.)
Q20
IC301 (SVISTK2038B) Power amplifier
D301
R316
R317
R319
D41
D42
R41
R42
D414
AC 28.1V
D413
C41
C42
R416
R44
Q41
R45
Q42
R43
R56
C43
Point Ⓐ
Q43
Q44
R48
C44
I_1
I_2
I_3
D404
D403
C402
6800μ
R318
R320
Rch. IN
R1
R2
Q1
Q2
Q3
Q5
R3
R4
R5
R6
R7
Q4
Q6
Q7
R8
R9
C317
+Vcc
−Vcc
SP
Right channel
Q14
R17
R18
C318
+Vcc
−Vcc
SP

DISASSEMBLY INSTRUCTIONS

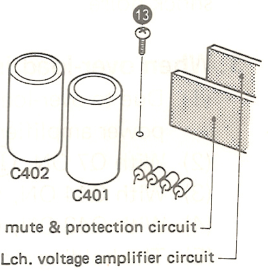
1. How to remove the cabinet

(1) Remove the 4 setscrews on the side and back of the cabinet. [Fig. 1: ❶ ~ ❹]

(2) Remove the cabinet from the chassis and rear panel as in Fig. 1.


Cabinet
❷
❶
⓫
Screw-driver
Claw Ⓓ
Rear panel
Cabinet
Nut
bass
treble
balance
❿
❽
Nut
❸
❼
tape
Knob
Front panel
❹
❾

[Fig. 1]


⓭
C402
C401
Power mute & protection circuit
Lch. voltage amplifier circuit

[Fig. 1-1]

2. How to remove the bottom board

(1) Remove the 3 setscrews [Fig. 2: ❺ ~ ❼] of the bottom board. [Screw ❼ is also used to fit the front panel.]

(2) Remove the setscrew [Fig.1-1: ⓭] of the printed circuit board.

(3) Lift the back [rear panel] of bottom board and remove claw Ⓒ from the rear panel.

(4) Lifting the back of bottom board, insert a flat-head screwdriver between the front chassis and bottom board as in Fig. 3 in order to remove claw Ⓐ.

(5) Remove the bottom board from the chassis.

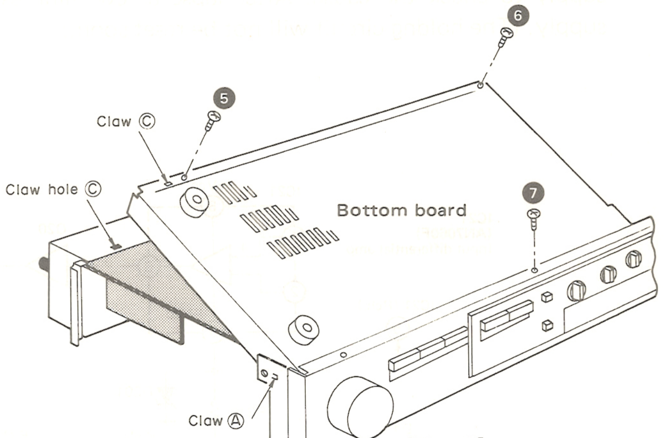
3. How to fit the bottom board

(1) Insert the front of bottom board between the front chassis and front panel.

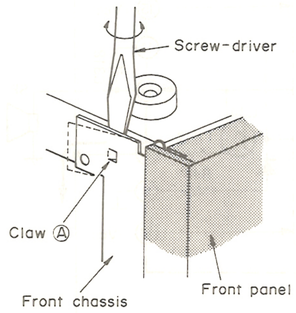
(2) Insert claw Ⓑ of board into claw hole Ⓑ of front chassis. [See Fig. 4]

(3) Insert claw Ⓒ of bottom board into claw hole Ⓒ of rear panel. [See Fig. 5.]

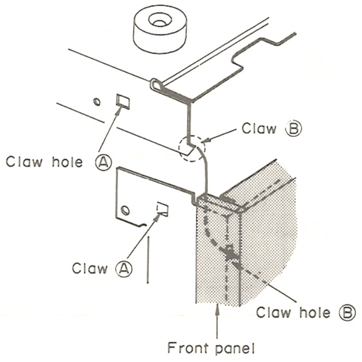
(4) Secure it with 4 setscrews.


❻
❺
Claw Ⓒ
Claw hole Ⓒ
Bottom board
❼
Claw Ⓐ

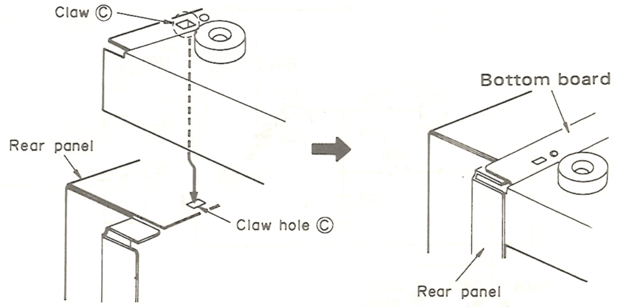
[Fig. 2]


Screw-driver
Claw Ⓐ
Front chassis
Front panel

[Fig. 3]


Claw Ⓑ
Claw hole Ⓐ
Claw Ⓐ
Claw hole Ⓑ
Front panel

[Fig. 4]


Claw Ⓒ
Rear panel
Claw hole Ⓒ
Bottom board
Rear panel

[Fig. 5]

4. How to remove the front panel

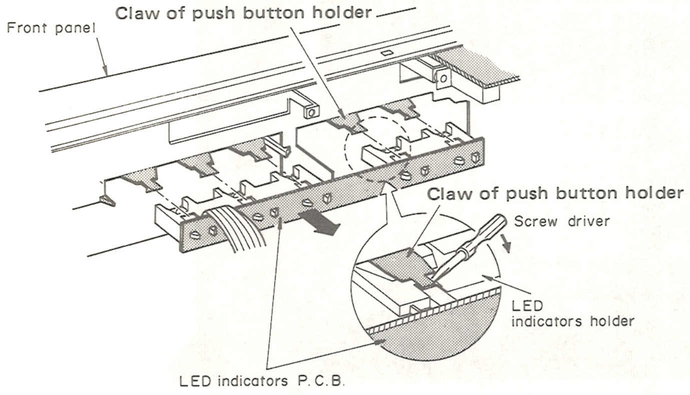
(1) Remove the 5 setscrews [Fig. 1: ❼ ~ ⓫] of front panel. [Screw ❼ is also used to fit the bottom board.]

(2) Stick an adhesive tape to bass, treble and balance knobs as in Fig. 1, then pull them off the front panel.

(3) Remove the nuts of bass, treble and balance knobs.

(4) Insert a falt-head screwdriver between the front panel and chassis in order to remove claw Ⓓ. [See Fig. 1.]

(5) Remove the front panel.


Front panel
Claw of push button holder
Claw of push button holder
Screw driver
LED indicators holder
LED indicators P.C.B.

[Fig. 6]

5. How to remove the LED indicator P.C.B.

(1) Remove the LED indicator holder and push-button holder by use of a screwdriver, gaining access from the inside of chassis as shown in Fig. 6. [Remove the 5 claws of push-button holder.]

(2) Pull the P.C.B. toward the inside of chassis.

6. How to remove the FL meter P.C.B.

(1) Remove the front panel.

(2) Remove the setscrew ⓬ of meter range switch button as in Fig. 7.

(3) Push the FL holder claw in the direction of the arrow (➡) and then pull the P.C.B. backwards.

(4) Next, incline the P.C.B. in the direction of the arrow ① as in Fig. 8. Then pull it in the direction of the arrow ② to remove it from the chassis.

7. How to install the FL meter P.C.B.

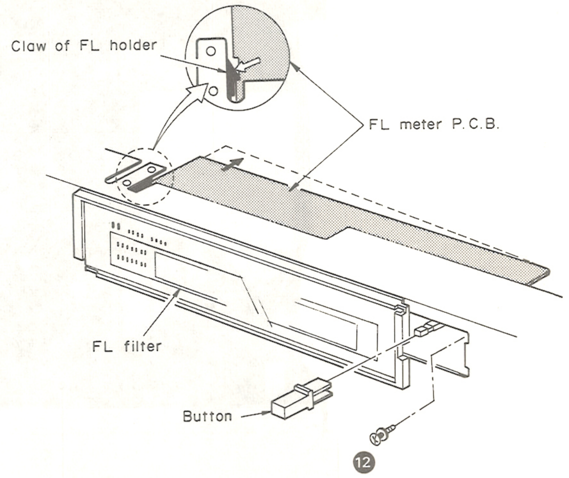
*The P.C.B. can be installed by reversing the procedure for removal. Fit the FL as follows:

(1) Remove the FL filter. [Fig. 7]

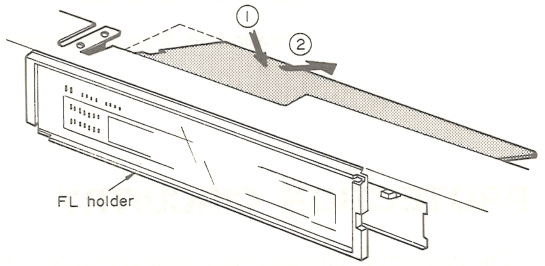
(2) Fit the right and left sides of FL into the stopper of FL holder as in Fig. 9.

(3) Fit the P.C.B. in the original position.

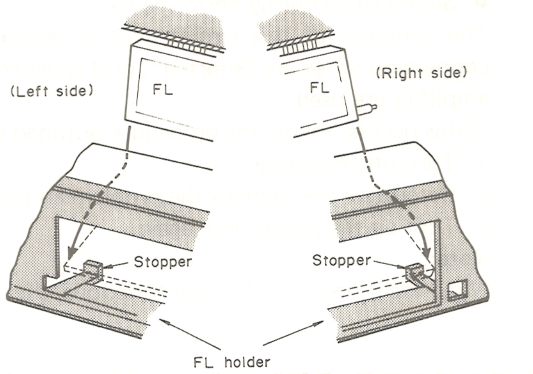
(4) Set the FL filter in place.


Claw of FL holder
FL meter P.C.B.
FL filter
Button
⓬

[Fig. 7]


①
②
FL holder

[Fig. 8]


(Left side)
FL
FL
(Right side)
Stopper
Stopper
FL holder

[Fig. 9]

8. How to remove the front chassis

*When replacing the push-button switches or the repairing the headphone jack P.C.B., remove the front chassis as follows:

(1) Remove the front panel.

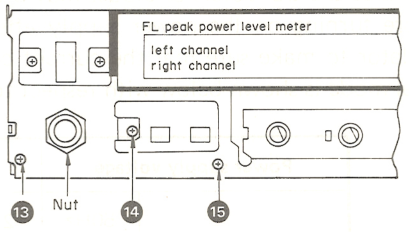
(2) Remove the bottom board.

(3) Remove the LED indicator P.C.B. [See Fig. 6.]

(4) Remove the 3 setscrews [Fig. 10: ⓭ ~ ⓯] and the nut of headphone jack.

(5) Insert a screwdriver between the front chassis and the panel in order to remove claw Ⓐ as shown in Fig. 11.

(6) Remove the front chassis from the main P.C.B.


FL peak power level meter
left channel
right channel
⓭
Nut
⓮
⓯

[Fig. 10]

ESPAÑOL

ESPECIFICACIONES

(Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

(DIN 45 500)

SECCION AMPLIFICADOR

Potencia continua de 20 Hz~20 kHz en ambos canales	2 × 35W (4Ω) 2 × 35W (8Ω)
Potencia continua de 40 Hz~16 kHz en ambos canales	2 × 35W (4Ω) 2 × 35W (8Ω)
Potencia continua de 1 kHz en ambos canales	2 × 40W (4Ω) 2 × 40W (8Ω)
Distorsión armónica total	
potencia de régimen a 20 Hz~20 kHz	0,05% (4Ω) 0,03% (8Ω)
potencia de régimen a 40 Hz~16 kHz	0,05% (4Ω) 0,03% (8Ω)
potencia de régimen a 1 kHz	0,007% (4Ω), 0,005% (8Ω)
mitad de potencia a 20 Hz~20 kHz	0,03% (8Ω)
mitad de potencia a 1 kHz	0,005% (8Ω)
−26 dB de potencia a 1 kHz	0,01% (4Ω)
50 mW de potencia a 1 kHz	0,01% (4Ω)
Distorsión por intermodulación	
potencia de régimen a 250 Hz: 8 kHz=4:1, 4Ω	0,05%
potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,03%
Ancho de banda de potencia con ambos canales, −3 dB	10 Hz~25 kHz (4Ω) 10 Hz~25 kHz (8Ω)
Zumbido residual y ruido	0,6 mV
Factor de amortiguamiento	20 (4Ω), 40 (8Ω)
Sensibilidad e impedancia de entrada	
TOCADISC. (PHONO)	2,5 mV/47kΩ
SINTON., AUX. (TUNER, AUX)	150 mV/22kΩ
GRAB. 1 (TAPE 1)	150 mV/22kΩ
GRAB. 2 (TAPE 2)	150 mV/22kΩ
Voltaje máximo de entrada de PHONO (1 kHz, RMS)	150 mV
Respuesta de frecuencia	
TOCADISC. (PHONO)	curva RIAA estándar ±0,8 dB (30 Hz~15 kHz)
SINTON., AUX., GRAB. (TUNER, AUX, TAPE)	5 Hz~80 kHz (−3 dB)
Relación de señal a ruido	
potencia de régimen (4Ω)	
TOCADISC. (PHONO)	75 dB (IHF, A: 81 dB)
SINTON., AUX., GRAB. (TUNER, AUX, TAPE)	86 dB (IHF, A: 97 dB)
−26 dB de potencia (4Ω)	
TOCADISC. (PHONO)	65 dB
SINTON., AUX., GRAB. (TUNER, AUX, TAPE)	65 dB
50 mW de potencia (4Ω)	
TOCADISC. (PHONO)	62 dB
SINTON, AUX., GRAB. (TUNER, AUX, TAPE)	62 dB
Controles de tono	
BAJOS (BASS)	50 Hz, +10 dB~ −10 dB
AGUDOS (TREBLE)	20 kHz, +10 dB~ −10 dB
Control de sonoridad (volumen a −30 dB)	50 Hz, +9 dB
Voltaje de salida	
SAL. GRAB. (REC OUT)	150 mV
Equilibrio de canales, AUX 250 Hz~6.300 Hz	±1 dB
Separación de canales, AUX 1 kHz	50 dB
Impedancia y nivel de salida de los auriculares	390 mV/330Ω
Impedancia de carga	
MAIN o REMOTE/MAIN y REMOTE	4Ω~16Ω/8Ω~16Ω

GENERAL

Consumo de energía	310W
Requisito de energía	CA 50 Hz/60 Hz, 220V (Para Europa continental) CA 50 Hz/60 Hz, 110V/120V/220V/240V (Para otros paises)
Dimensiones (An.×Al.×Prof.)	430 × 86 × 288 mm
Peso	5,8 kg

Nota:
La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

AJUSTES

Medidor fluorescente de potencia de cresta

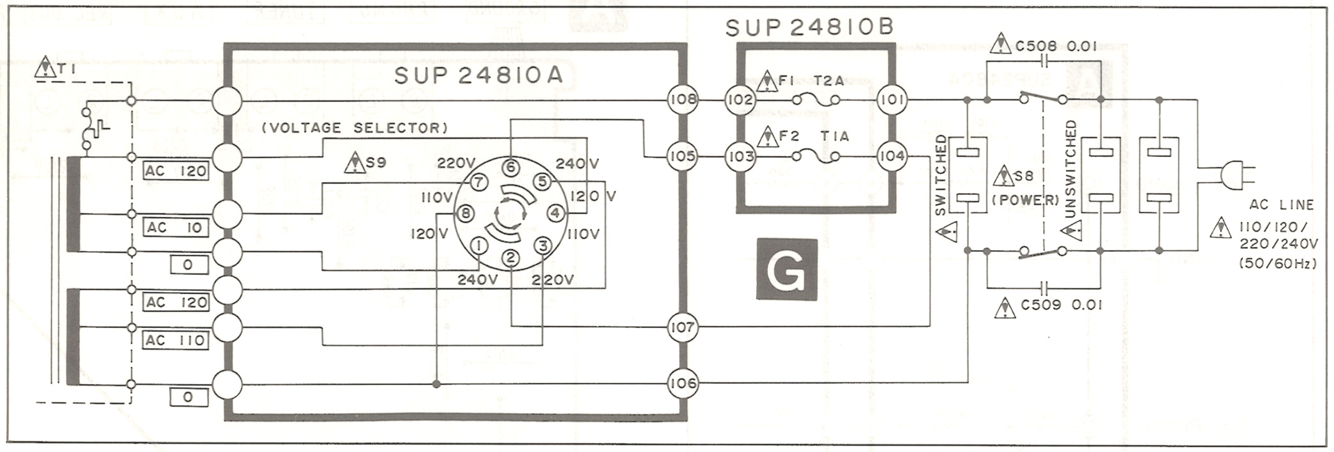
Puesta

- Conectar un oscilador de baja frecuencia al terminal de entrada de sintonizador, y el resistor de carga 8-ohmios y voltímetro electrónico de CA al terminal del altavoz.
- Añadir señal 1kHz del oscilador de baja frecuencia al aparato.
- Poner el volumen de sonido al punto máximo.

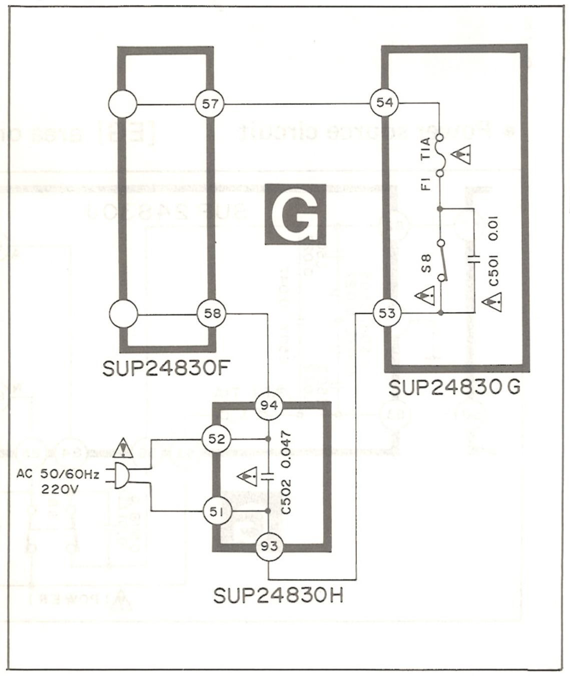
Item	Posición de interruptor selector de gama de medidor	RV ajustado	Procedimiento de ajuste
Indicadores de potencia-cresta	Interruptor de gama ... X0.01	VR601 (Canal I) VR602 (Canal D)	1. Ajustar el nivel de entrada de manera que el voltímetro de CA indique 2 voltios. 2. Ajustar los resistores variables semifijos VR601 (C.I.) y VR602 (C.D.) de manera que el segmento de 50W del medidor FI se ilumine débilmente (Fig. 14)

CIRCUITS TO BE CHANGED AND THE AREAS

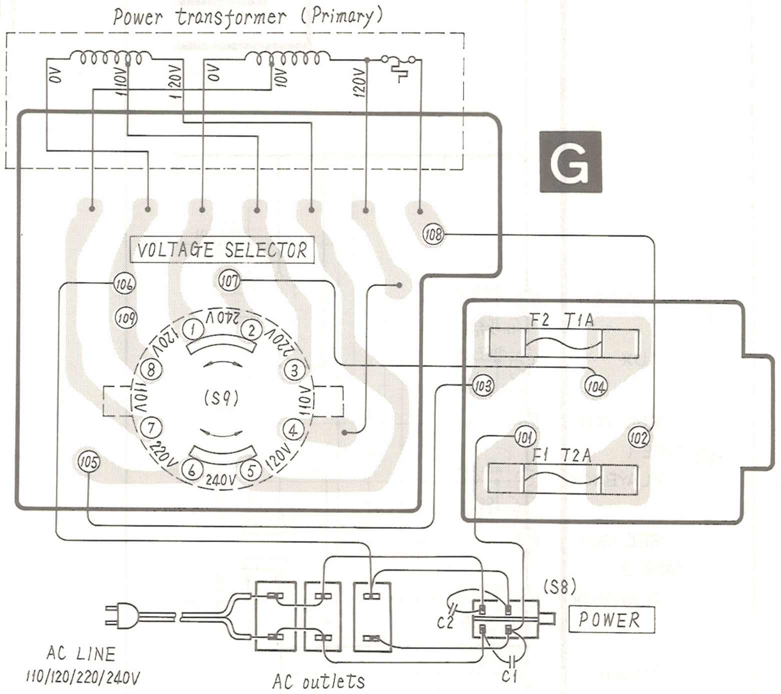
- Power source circuit [XA] area


SUP 24810B
SUP 24810A
T1
(VOLTAGE SELECTOR)
S9
AC 120
AC 10
0
AC 120
AC 110
0
220V
240V
110V
120V
120V
110V
240V
220V
106
105
107
106
102
101
103
104
F1 T2A
F2 T1A
C508 0.01
C509 0.01
S8 (POWER)
SWITCHED
UNSWITCHED
G
AC LINE
110/120/220/240V (50/60Hz)

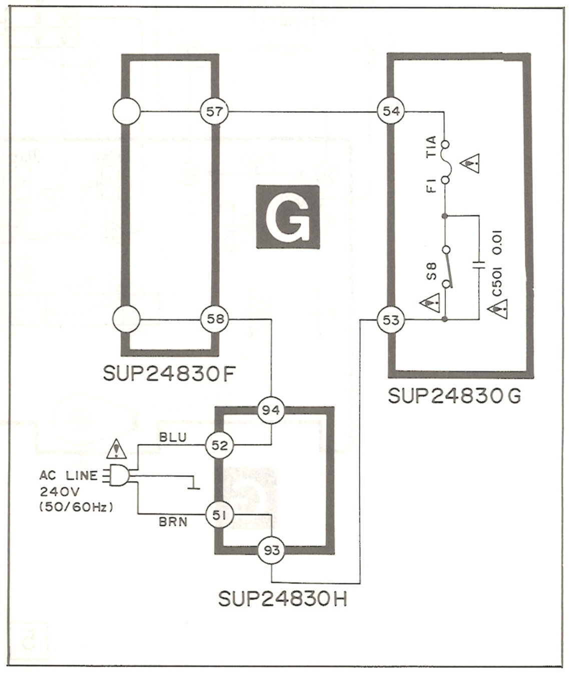
[EF] area


57
54
58
53
G
F1 T1A
S8
C501 0.01
SUP24830F
SUP24830G
94
52
51
93
C502 0.047
AC 50/60Hz 220V
SUP24830H

[XA] area


Power transformer (Primary)
0V
110V
120V
0V
110V
120V
G
VOLTAGE SELECTOR
106
107
108
109
105
(S9)
240V
220V
110V
120V
F2 T1A
F1 T2A
103
104
101
102
(S8)
POWER
C2
C1
AC LINE
110/120/220/240V
AC outlets

[XL] area

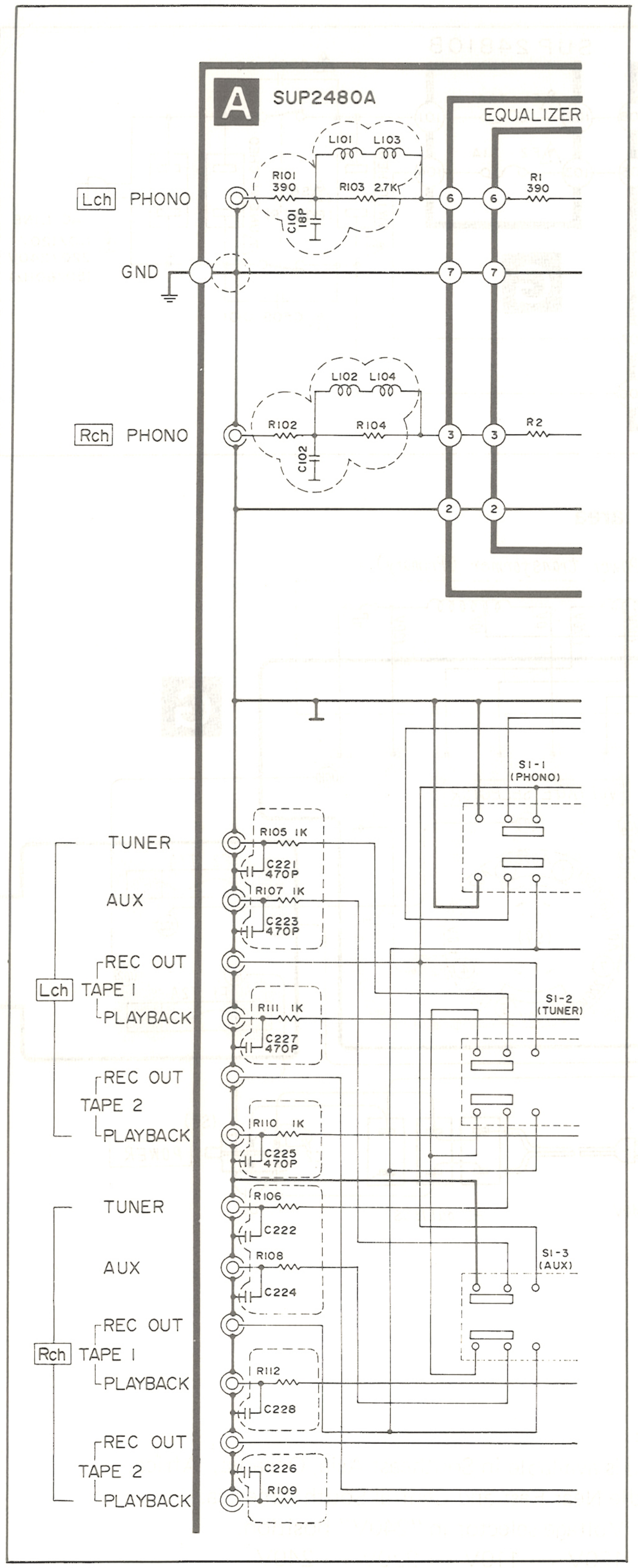

57
54
G
F1 T1A
S8
C501 0.01
58
53
SUP24830F
SUP24830G
94
BLU
52
AC LINE 240V (50/60Hz)
51
BRN
93
SUP24830H

Notes:

- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * S9 : Voltage selector in "240V" position.
  120V ⟷ 110V ⟷ 220V ⟷ 240V
- * [EF] is available in France.
- * [XL] is available in Australia.

[EG] is available in F.R. Germany.

• Input terminal circuit [EG] area only

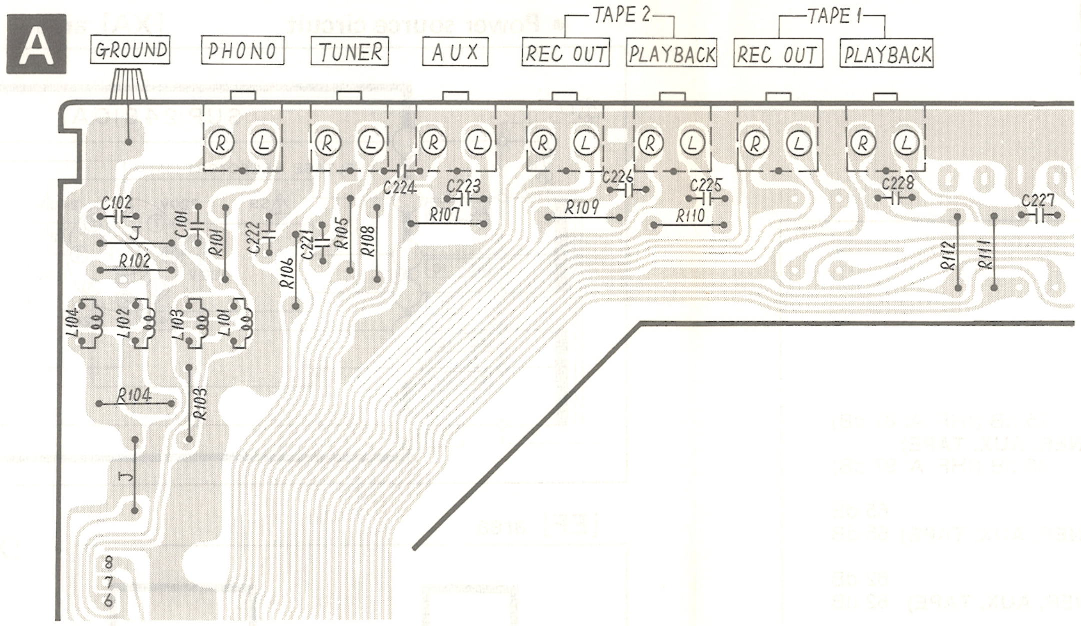

A
SUP2480A
EQUALIZER
Lch PHONO
GND
Rch PHONO
L101 L103
R101 390
C101 18P
R103 2.7K
L102 L104
R102
R104
C102
R1 390
R2
S1-1 (PHONO)
S1-2 (TUNER)
S1-3 (AUX)
TUNER
AUX
REC OUT
TAPE 1
PLAYBACK
REC OUT
TAPE 2
PLAYBACK
Lch
Rch
R105 1K
C221 470P
R107 1K
C223 470P
R111 1K
C227 470P
R110 1K
C225 470P
R106
C222
R108
C224
R112
C228
C226
R109

• Volume control circuit

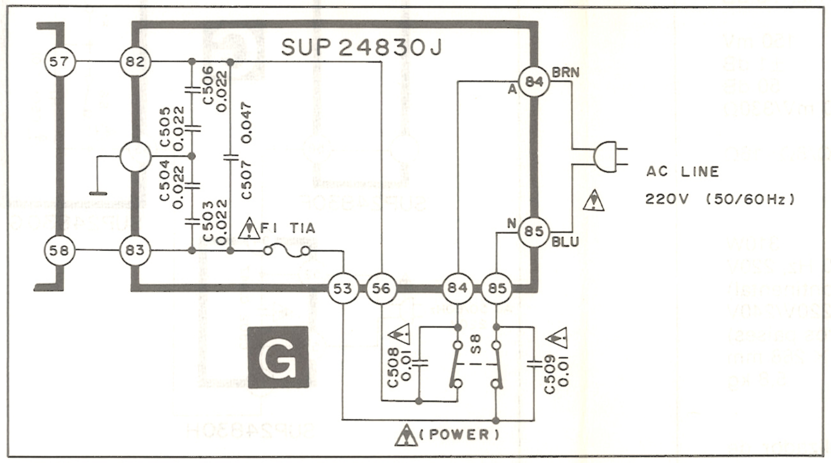
Change of resistor value
R201, 202 (2.7kΩ → 2.2kΩ)

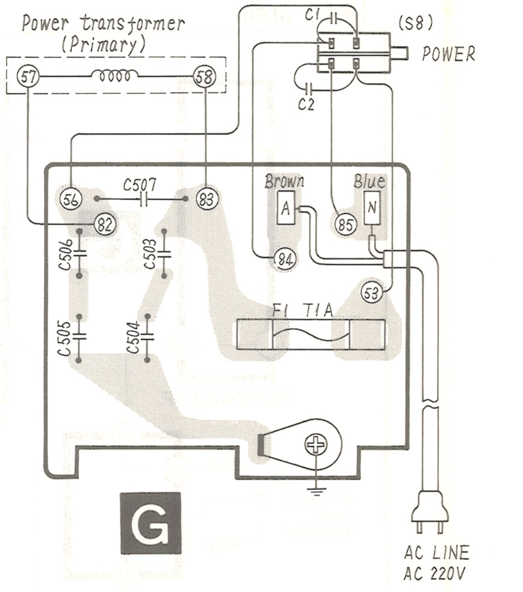
Deletion of capacitor
C203, 204 (470pF → Deletion)

Additional parts

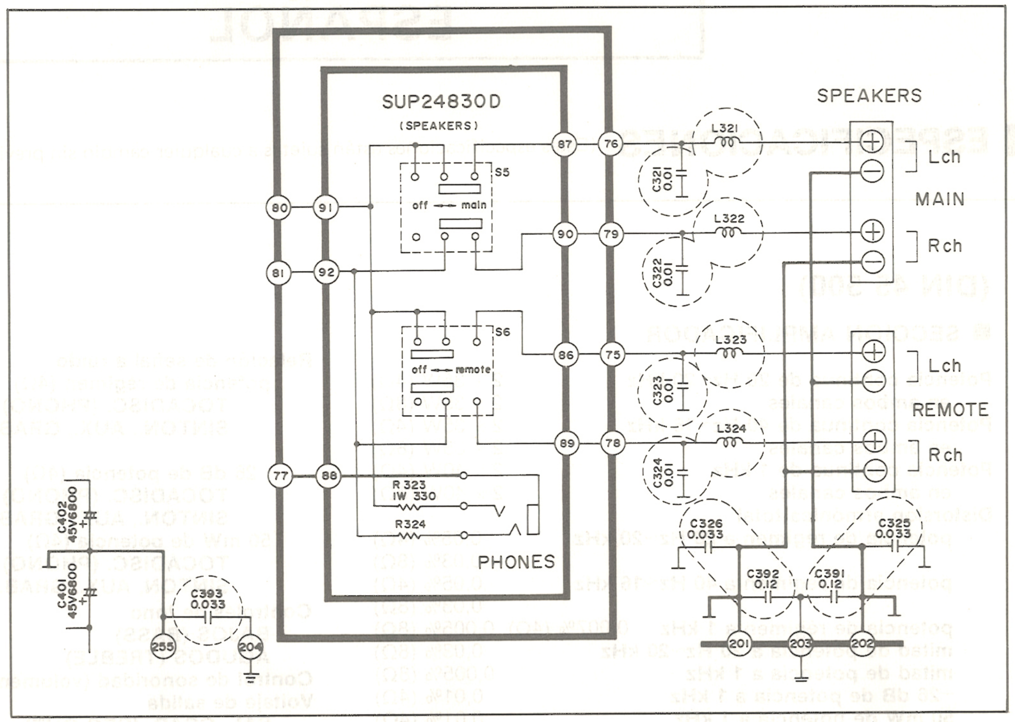

A
GROUND
PHONO
TUNER
AUX
TAPE 2
REC OUT
PLAYBACK
TAPE 1
REC OUT
PLAYBACK
R
L
C102
R102
C101
R101
C222
R106
C221
R105
R108
C224
C223
R107
C226
R109
C225
R110
C228
C227
R112
R111
L104
L102
L103
L101
R104
R103
J
8
7
6

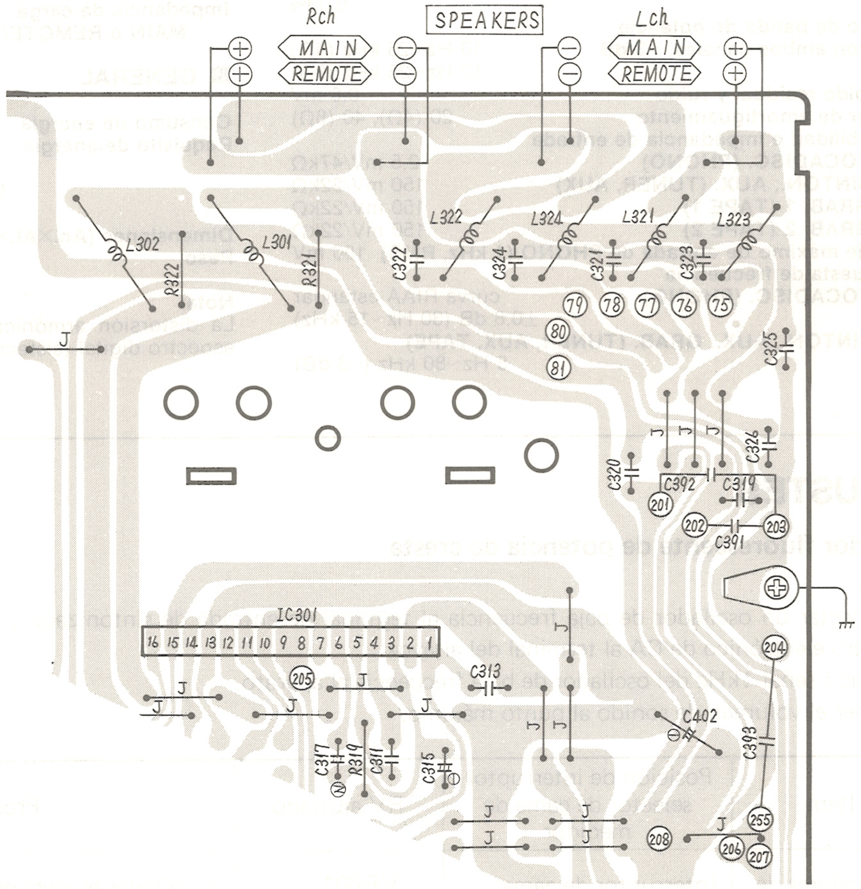
• Power source circuit [EG] area only


SUP24830J
57
58
82
83
C505 0.022
C506 0.022
C504 0.022
C503 0.022
C507 0.047
F1 T1A
BRN
A
84
N
85
BLU
AC LINE
220V (50/60Hz)
53
56
84
85
C508 0.01
S8
C509 0.01
(POWER)
G

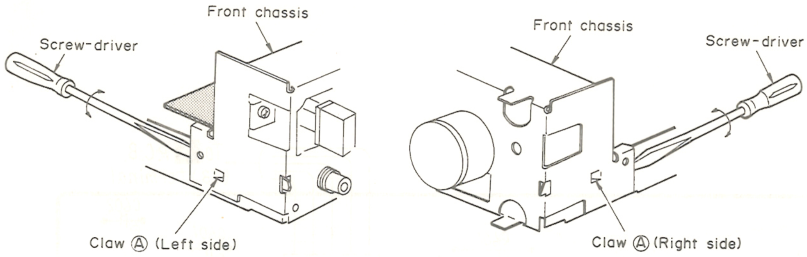

Power transformer (Primary)
57
58
C1
C2
(S8)
POWER
C507
56
82
83
Brown
A
Blue
N
85
84
53
C506
C503
C505
C504
F1 T1A
AC LINE
AC 220V
G

• Speaker terminal and speaker ground circuit [EG] area only

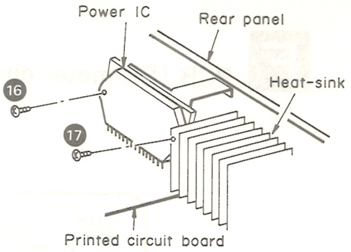

SUP24830D
(SPEAKERS)
SPEAKERS
S5
off — main
S6
off — remote
L321
L322
L323
L324
C321 0.01
C322 0.01
C323 0.01
C324 0.01
Lch
MAIN
Rch
Lch
REMOTE
Rch
87
76
80
91
90
79
81
92
86
75
77
88
89
78
R323 1W 330
R324
PHONES
C402 45V6800
C401 45V6800
C393 0.033
255
204
C326 0.033
C325 0.033
C392 0.12
C391 0.12
201
203
202


Rch
MAIN
REMOTE
SPEAKERS
Lch
MAIN
REMOTE
L302
R322
L301
R321
C322
L322
C324
L324
C321
L321
C323
L323
79
78
77
76
75
80
81
C325
J
C326
C320
C392
C319
201
202
203
C391
IC301
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
205
C313
204
C402
C393
C317
R319
C311
C315
208
206
207
255

Printed in Japan
82039060®KK


Front chassis
Screw-driver
Claw Ⓐ (Left side)
Front chassis
Screw-driver
Claw Ⓐ (Right side)

[Fig. 11]


Power IC
Rear panel
Heat-sink
⑯
⑰
Printed circuit board

[Fig. 12]

9. How to remove the power IC

(1) Remove the cabinet and bottom board. (Refer to "How to remove the cabinet" and "How to remove the bottom board")

(2) Unsolder the power IC.

(3) Remove the 2 setscrews (Fig. 12: ⑯, ⑰) used to secure the power IC on the heat-sink, and then pull out the power IC.

(4) When installing the power IC, apply heat diffusing agent (silicon powder, etc.) to back side of the IC, and secure it on the heat-sink with setscrews.

ADJUSTMENTS

Fluorescent peak power meter

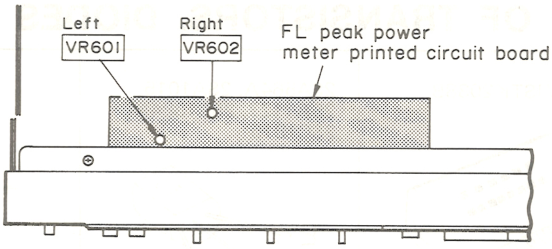
Setting

- Connect a low frequency oscillator to the tuner input terminal, and 8-ohm load resistor and AC electronic voltmeter to the speaker terminal.
- Add 1kHz signal from the low frequency oscillator to the set.
- Set the sound volume to the maximum point.

Item	Meter range select switch position	VR adjusted	Adjustment
Peak-power indicators	Range switch ... X0.01	VR601 (L ch) VR602 (R ch)	1. Adjust the input level so that the AC voltmeter indicates 2 volts. 2. Adjust the semi-fixed variable resistors VR601 (L ch.) and VR602 (R ch.) so that the 50W segment of FL meter lights up dimly. (Fig. 14)

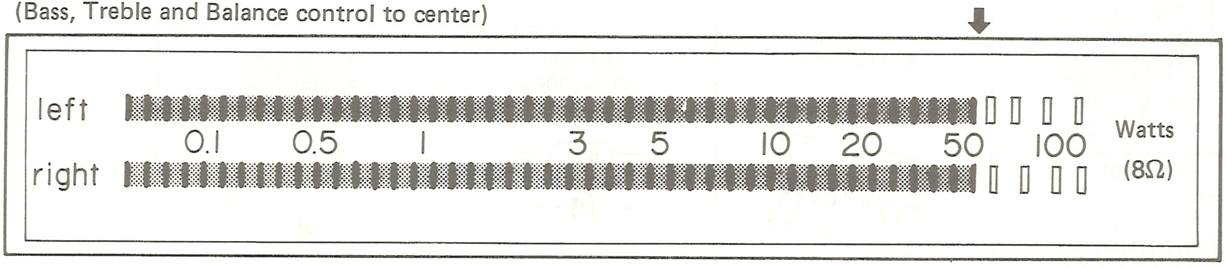
- **Adjustment points**

[Fig. 13]
[Abb. 13]


Left
VR601
Right
VR602
FL peak power meter printed circuit board

x 0.01 meter range
(8Ω, 2V output)

(Bass, Treble and Balance control to center)

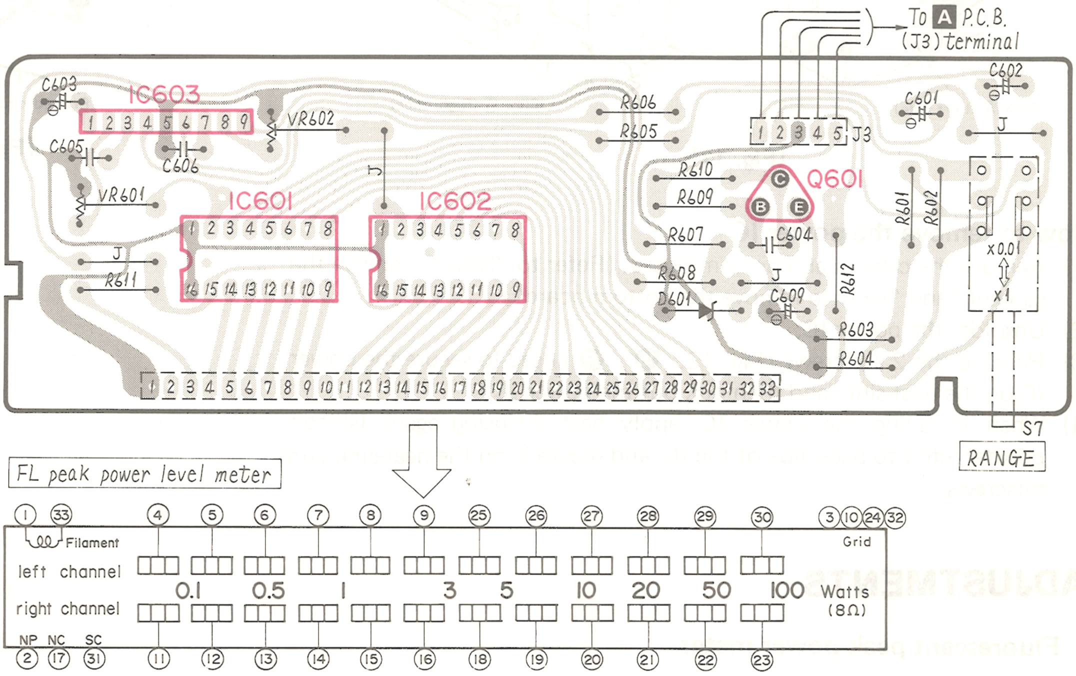

left
0.1
0.5
1
3
5
10
20
50
100
right
Watts
(8Ω)

[Fig. 14] [Abb. 14]

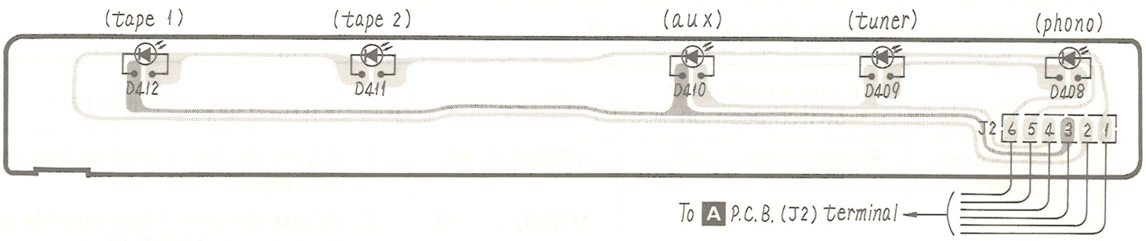
PRINTED CIRCUIT BOARDS

F PCB (FL meter circuit)

▨ Ground (Earth) line

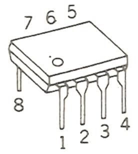

To A P.C.B. (J3) terminal
C603
IC603
1 2 3 4 5 6 7 8 9
VR602
C605
C606
VR601
J
IC601
IC602
1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9
R611
R606
R605
J3
C602
C601
Q601
C
B
E
R610
R609
R607
C604
R608
D601
C609
R612
R601
R602
R603
R604
x0.01
x1
S7
RANGE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33
FL peak power level meter
① ㉝ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ③ ⑩ ㉔ ㉜
Filament
Grid
left channel
right channel
0.1 0.5 1 3 5 10 20 50 100 Watts (8Ω)
NP NC SC
② ⑰ ㉛ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓

C PCB (Selector position LED indicators)

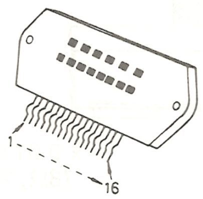

(tape 1)
(tape 2)
(aux)
(tuner)
(phono)
D412
D411
D410
D409
D408
J2
6 5 4 3 2 1
To A P.C.B. (J2) terminal

TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S

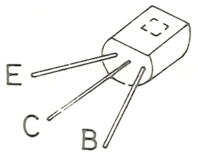
SVINJM2043DD



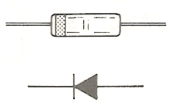
SVISTK2038B



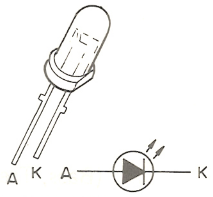
2SA564A, 2SA1015, 2SA1123, 2SC1384NC, 2SC1815



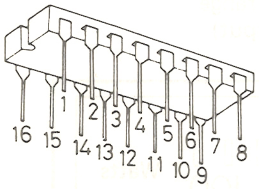
MA150, MA162A



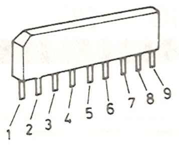
LN31GCPHL (Green)
LN41YCPHL (Yellow)



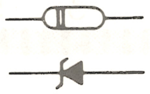
SVIHA12010


1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9

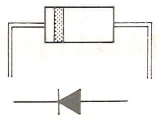
SVITA7318P



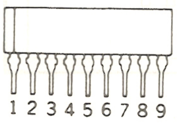
MA1200, SVDMZ306A

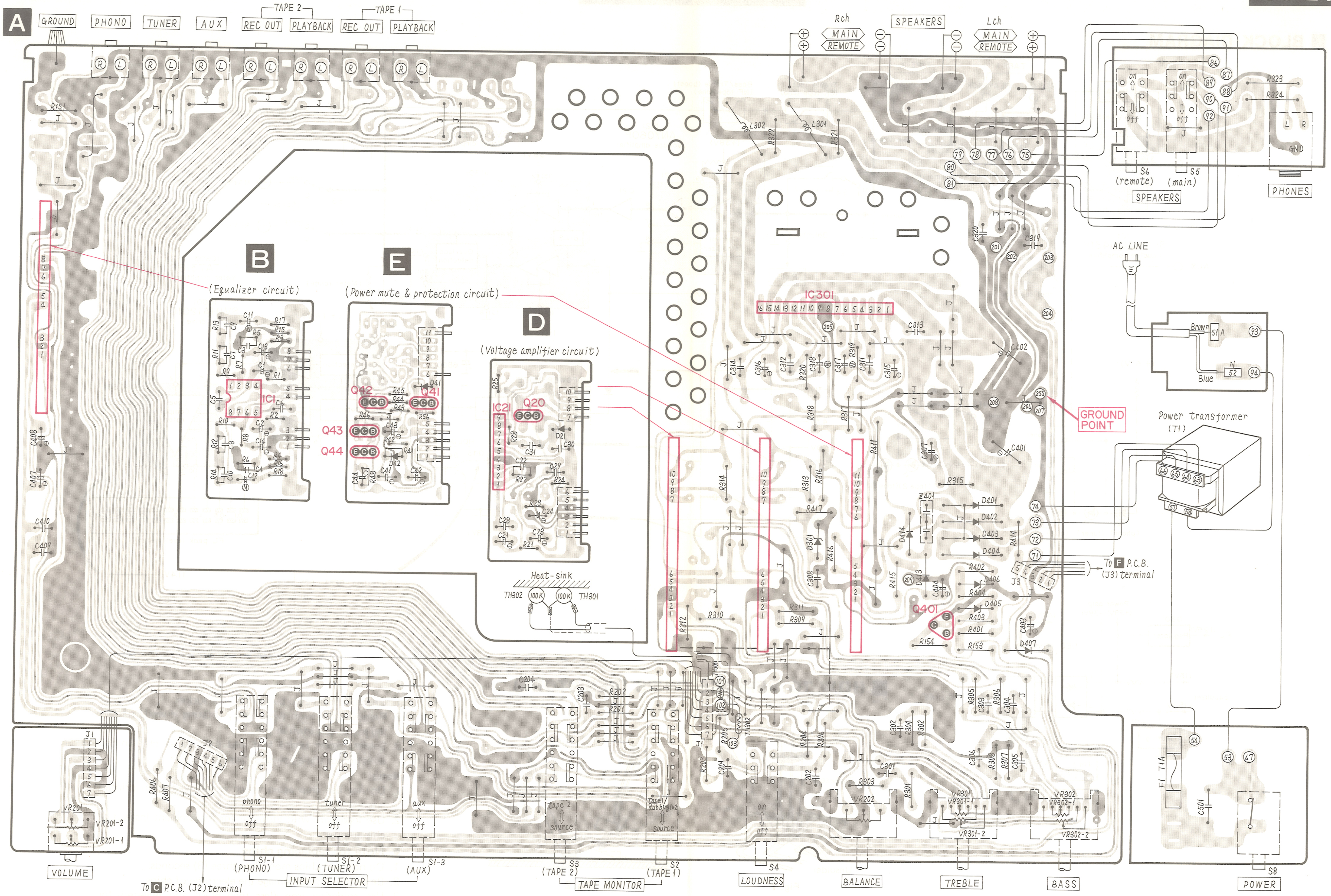


SVDS2V20, SVDSR1K2

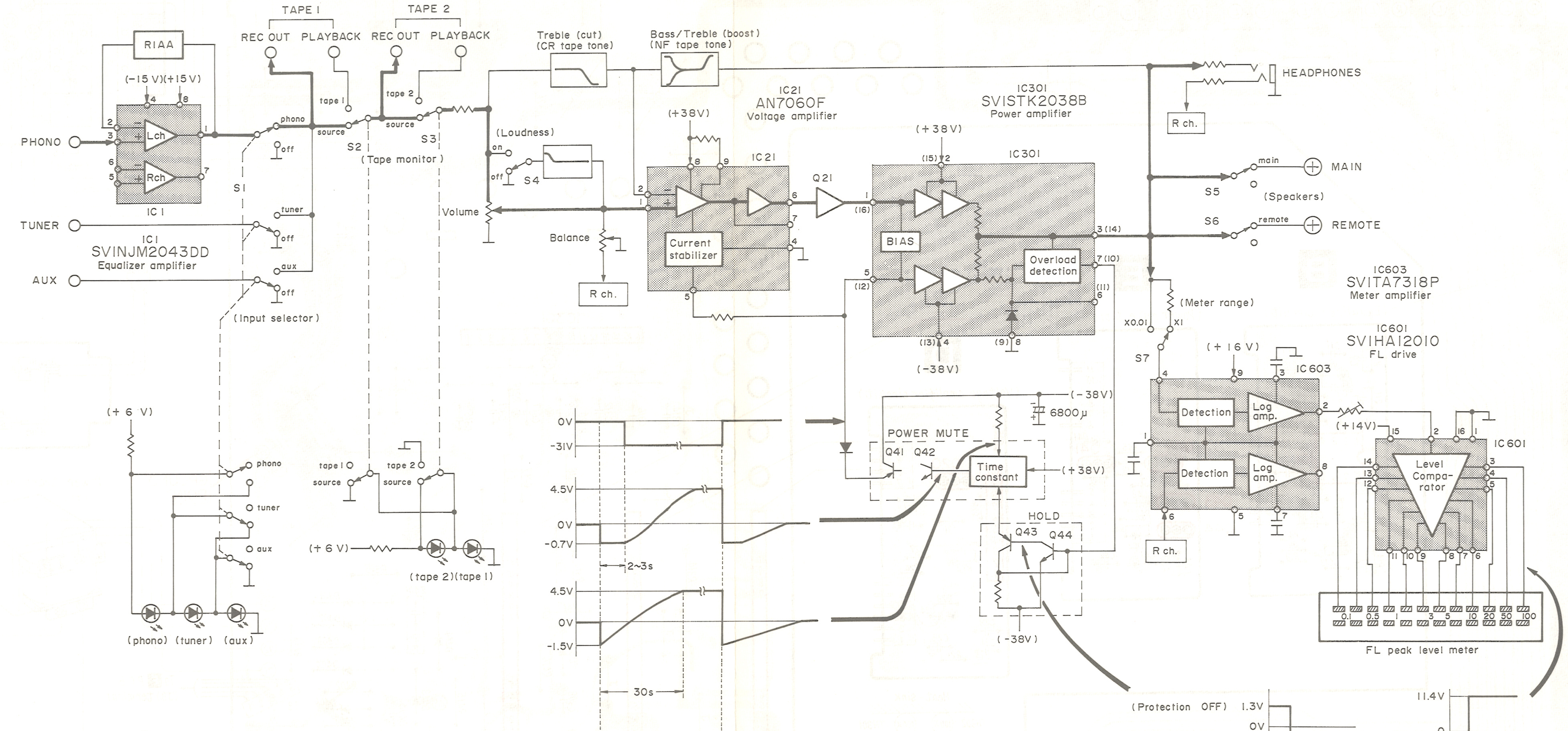


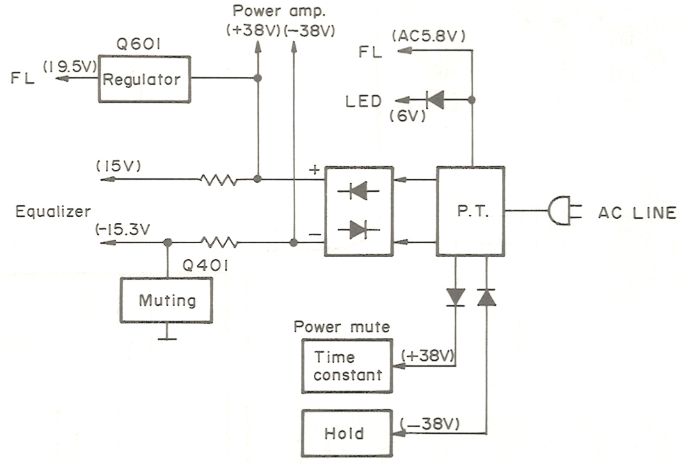
AN7060F




A
GROUND
PHONO
TUNER
AUX
TAPE 2
REC OUT
PLAYBACK
TAPE 1
REC OUT
PLAYBACK
Rch
MAIN
REMOTE
SPEAKERS
Lch
MAIN
REMOTE
on
off
S6
(remote)
S5
(main)
SPEAKERS
R323
R324
L
R
GND
PHONES
AC LINE
Brown
Blue
Power transformer
(T1)
GROUND POINT
B
(Equalizer circuit)
IC1
E
(Power mute & protection circuit)
Q41
Q42
Q43
Q44
D
(Voltage amplifier circuit)
IC21
Q20
IC301
Q401
Heat-sink
TH302
TH301
L302
L301
To F P.C.B.
(J3) terminal
J1
J2
VR201
VR201-2
VR201-1
VOLUME
To C P.C.B. (J2) terminal
phono
tuner
aux
off
S1-1
(PHONO)
S1-2
(TUNER)
S1-3
(AUX)
INPUT SELECTOR
tape 2
source
tape 1 dubbing 1→2
source
S3
(TAPE 2)
S2
(TAPE 1)
TAPE MONITOR
on
off
S4
LOUDNESS
VR202
BALANCE
VR301
VR301-1
VR301-2
TREBLE
VR302
VR302-1
VR302-2
BASS
F1 T1A
C501
S8
POWER

BLOCK DIAGRAM


TAPE 1
TAPE 2
REC OUT
PLAYBACK
RIAA
(−15 V)(+15 V)
PHONO
Lch
Rch
IC1
IC1
SVINJM2043DD
Equalizer amplifier
TUNER
AUX
phono
tuner
aux
off
S1
(Input selector)
source
tape 1
tape 2
S2
S3
(Tape monitor)
Treble (cut)
(CR tape tone)
Bass/Treble (boost)
(NF tape tone)
(Loudness)
on
off
S4
Volume
Balance
R ch.
IC21
AN7060F
Voltage amplifier
(+38V)
Current stabilizer
Q21
IC301
SVISTK2038B
Power amplifier
BIAS
Overload detection
(−38V)
HEADPHONES
MAIN
REMOTE
S5
S6
main
remote
(Speakers)
(Meter range)
X0.01
X1
S7
IC603
SVITA7318P
Meter amplifier
IC601
SVIHA12010
FL drive
(+16 V)
Detection
Log amp.
(+14V)
Level Comparator
0.1
0.5
1
3
5
10
20
50
100
FL peak level meter
POWER MUTE
Q41 Q42
Time constant
(+38V)
6800μ
HOLD
Q43 Q44
(+6 V)
(phono) (tuner) (aux)
(tape 2)(tape 1)
0V
−31V
4.5V
−0.7V
2~3s
−1.5V
30s
Power ON
Power OFF
(Protection OFF) 1.3V
(Protection ON) −38V
11.4V
Segment light up


Power amp.
(+38V)(−38V)
Q601
FL
(19.5V)
Regulator
(AC5.8V)
FL
LED
(6V)
(15V)
Equalizer
(−15.3V
Q401
Muting
P.T.
AC LINE
Power mute
Time constant
(+38V)
Hold
(−38V)

HOW TO REPLACE CHIPS (RESISTORS)

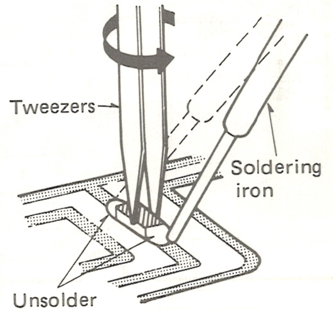

Tweezers
Soldering iron
Unsolder

Fig. 1

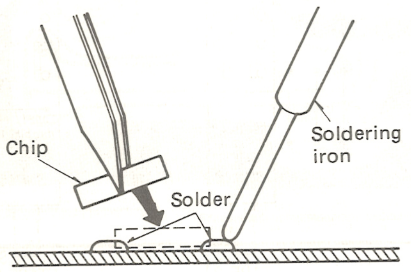

Chip
Soldering iron
Solder

Fig. 2

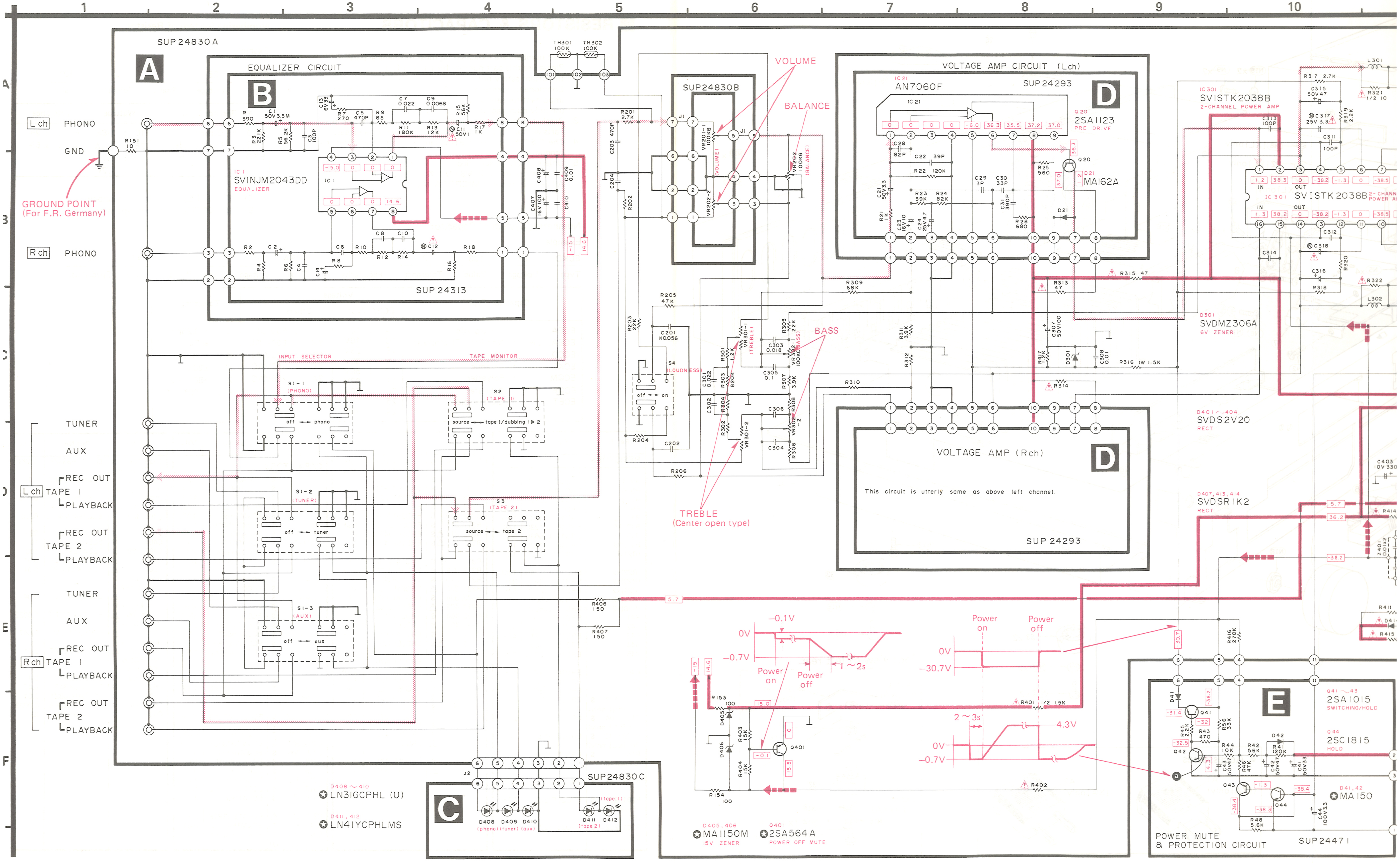
1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 1.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 2.

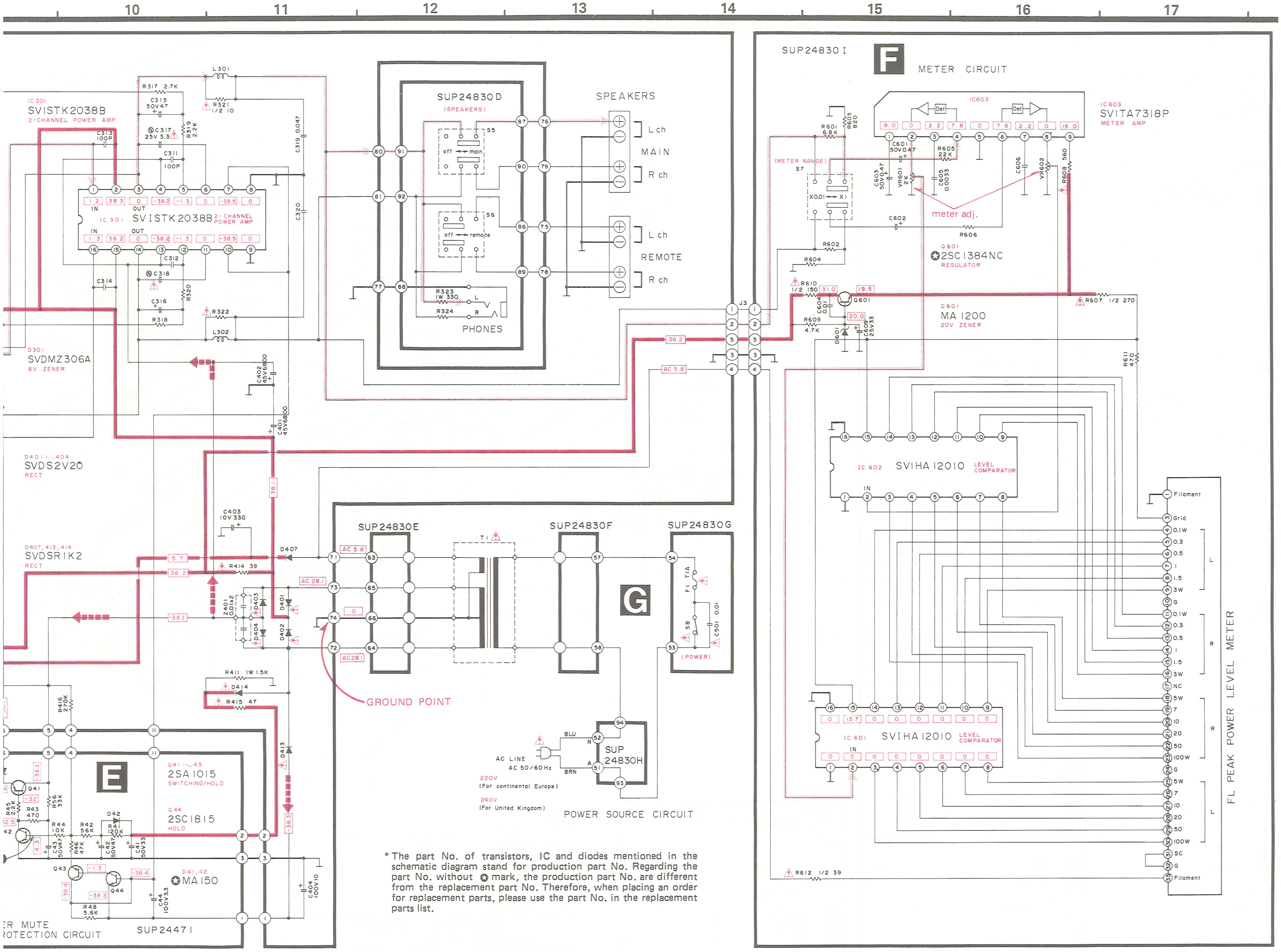
Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

- **Note for replacing chips**

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
SUP24830A
EQUALIZER CIRCUIT
SVINJM2043DD
EQUALIZER
SUP 24313
L ch PHONO
GND
R ch PHONO
GROUND POINT
(For F.R. Germany)
TH301 100K
TH302 100K
SUP24830B
VOLUME
BALANCE
BASS
TREBLE
(Center open type)
VOLTAGE AMP CIRCUIT (Lch)
AN7060F
SUP24293
2SA1123
PRE DRIVE
MA162A
VOLTAGE AMP (Rch)
This circuit is utterly same as above left channel.
SUP 24293
SVISTK2038B
2-CHANNEL POWER AMP
SVDMZ306A
6V ZENER
SVDS2V20
RECT
SVDSR1K2
RECT
INPUT SELECTOR
TAPE MONITOR
S1-1 (PHONO)
off phono
S2 (TAPE 1)
source tape 1/dubbing 1▶2
S1-2 (TUNER)
off tuner
S3 (TAPE 2)
source tape 2
S1-3 (AUX)
off aux
S4 (LOUDNESS)
off on
TUNER
AUX
REC OUT
L ch TAPE 1
PLAYBACK
REC OUT
TAPE 2
PLAYBACK
TUNER
AUX
REC OUT
R ch TAPE 1
PLAYBACK
REC OUT
TAPE 2
PLAYBACK
SUP24830C
D408 ~ 410
LN31GCPHL (U)
D411, 412
LN41YCPHLMS
D408 D409 D410 D411 D412
(phono) (tuner) (aux) (tape 1) (tape 2)
D405, 406
MA1150M
15V ZENER
Q401
2SA564A
POWER OFF MUTE
0V
−0.1V
−0.7V
Power on
Power off
1 ~ 2s
Power on
Power off
0V
−30.7V
2 ~ 3s
4.3V
0V
−0.7V
Q41 ~ 43
2SA1015
SWITCHING/HOLD
Q44
2SC1815
HOLD
D41, 42
MA150
POWER MUTE
& PROTECTION CIRCUIT
SUP24471


10
11
12
13
14
15
16
17
IC301
SVISTK2038B
2-CHANNEL POWER AMP
SVISTK2038B 2-CHANNEL POWER AMP
L301
R317 2.7K
C315 50V47
R321 1/2 10
C317 25V 3.3
R319 2.2K
C313 100P
C311 100P
C319 0.047
C320
C312
C318
C314
C316
R320
R318
R322
L302
D301
SVDMZ306A
6V ZENER
C402 45V6800
C401 45V6800
D401～404
SVDS2V20
RECT
C403 10V 330
D407, 413, 414
SVDSR1K2
RECT
D407
R414 39
R411 1W 1.5K
D414
R415 47
R416 270K
D401
D402
D403
D404
D413
SUP24830D
(SPEAKERS)
S5
off
main
S6
remote
SPEAKERS
L ch
MAIN
R ch
L ch
REMOTE
R ch
R323 1W 330
R324
PHONES
J3
SUP24830I
F
METER CIRCUIT
IC603
SVITA7318P
METER AMP
Det
R601 6.8K
R603 820
C601 50V0.47
R605 22K
C603 50V0.47
VR601 2K
C605 0.0033
C606
VR602
R608 560
(METER RANGE)
S7
X0.01
X1
meter adj.
C602
R606
R602
R604
Q601
2SC1384NC
REGULATOR
R610 1/2 150
Q601
R609 4.7K
C604
D601
C609 25V33
D601
MA1200
20V ZENER
R607 1/2 270
R611 470
IC602
SVIHA12010
LEVEL COMPARATOR
IN
IC601
SVIHA12010
LEVEL COMPARATOR
R612 1/2 39
Filament
Grid
0.1W
0.3
0.5
1
1.5
3W
G
5W
7
10
20
50
100W
SC
L
R
FL PEAK POWER LEVEL METER
SUP24830E
SUP24830F
SUP24830G
T1
G
F1 T1A
S8
C501 0.01
(POWER)
GROUND POINT
SUP24830H
BLU
BRN
N
A
AC LINE
AC 50/60Hz
220V
(For continental Europe)
240V
(For United Kingdom)
POWER SOURCE CIRCUIT
AC 5.8
AC 28.1
AC28.1
36.2
38.1
5.7
-38.2
E
Q41～43
2SA1015
SWITCHING/HOLD
Q44
2SC1815
HOLD
Q41
Q43
Q44
R45 2.2K
R43 470
R56 33K
R44 10K
R42 56K
R41 120K
D42
C43 50V47
R46 47K
C42 50V47
C41 50V33
D41, 42
MA150
C44 100V3.3
R48 5.6K
C404 100V10
ER MUTE
ROTECTION CIRCUIT
SUP24471

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. without ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

1. This is the basic circuit diagram (For continental Europe) of this unit.
   Note that part of the circuit is subject to change depending on the areas.
2. Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas [EG], [EF], [XL] and [XA], refer to the separate service manual (Order No. SD82033214C8–A).
3. **S1-1 ~ S1-3:** Input selector switch in "**phono**" position.
   (S1-1: phono S1-2: tuner S1-3: aux)
4. **S2:** Tape monitor (tape 1) switch in "**source**" position.
   source ⟷ tape 1/dubbing 1 ▶ 2
5. **S3:** Tape monitor (tape 2) switch in "**source**" position.
   source ⟷ tape 2
6. **S4:** Loudness switch in "**off**" position.
7. **S5:** Main speaker switch in **"on (main)"** position.
8. **S6:** Remote speaker switch in "**off**" position.
9. **S7:** FL meter range selector switch in "**X1**" position.
   X1 ⟷ X0.01
10. **S8:** Power source switch in "**on**" position.
11. **S9 ([XA] area only):** Voltage selector switch in "**240V**" position. (Refer to booklet contain)
    120V ⟷ 110V ⟷ 220V ⟷ 240V
12. ☐ Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the ground point taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
13. **Description of "GROUND POINT"**
    The GND terminal of the rear panel and the chassis can serve as ground (earth) for signals. However, for direct current, they may sometimes fail to work as ground to check the DC voltage because they are connected to the ground line through 10Ω resistor – except for F.R. Germany [EG]. For DC voltage check, the "GROUND POINT" shown in "Printed circuit board" must be used.
14. ▨▶ Phono signal lines of left channel
15. ➡ Positive (+B) voltage lines
16. ■■■▶ Negative (–B) voltage lines
17. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

REPLACEMENT PARTS LIST

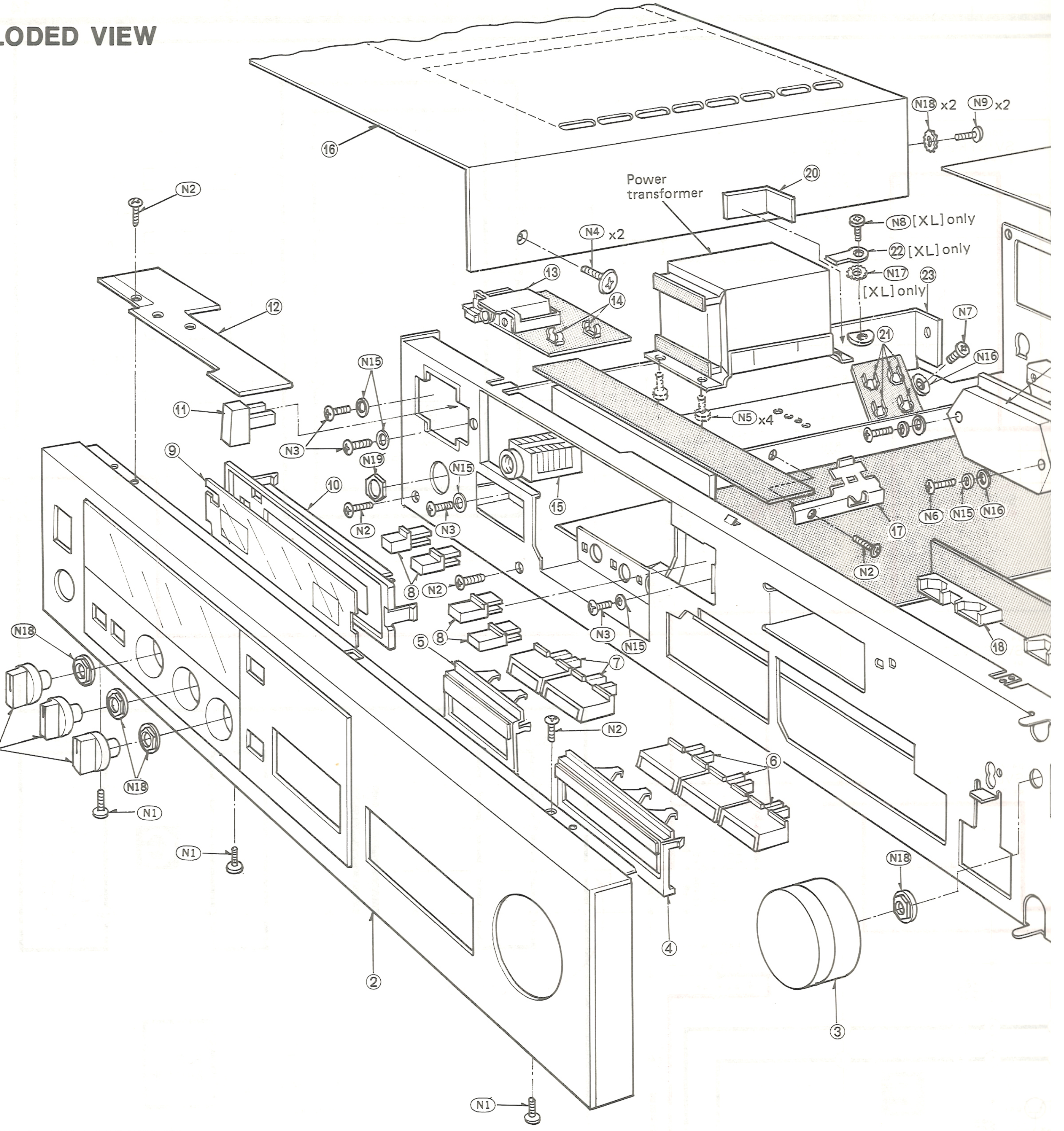
Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quantity per set.
6. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
7. Parts other than Ⓚ - and ○- marked are used for both black ans silver types.

Black type model No. SU-Z45 (K)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	SVINJM2043DD	Equalizer
(IC21)x2	AN7060F	Voltage AMP.
IC301	SVISTK2038B	Power AMP.
IC601, 602	SVIHA12010	Level Comparator
IC603	SVITA7318P	Meter AMP.
TRANSISTORS		
(Q20)x2	2SA1123–R	Pre Drive
Q41~43	2SA1015–Y	Switching/Hold
Q44	2SC1815–Y	Hold
Q401 **S**	2SA722–S	LED Drive
Q601 **S**	2SC1384AR	Regulator
DIODES		
(D21)x2, 41, 42 **S**	MA162A	Switching
D301	SVDMZ306A	6V, Zener
D401~404 ⚠	SVDS2V20	Rectifier
D405, 406 **S**	MA1150A	15V, Zener
D407, 413, 414 ⚠ **S**	SVDSR1K2	Rectifier
D408~410	LN31GCPHL	Light Emitting Diode
D411, 412	LN41YCP	Light Emitting Diode
D601	MA1200	20V, Zener
COILS		
L101~104 (for [EG] only)	ELQS181KB	Output
L301, 302	SLQY15G–30	Choke
L321~324 (for [EG] only)	SLQY07G–30	Choke
TRANSFORMERS		
T1 other areas ⚠	SLT5M219	Power Source
T1 [EK, XL] ⚠	SLT5M221	Power Source
T1 [XA] ⚠	SLT5M223	Power Source
VARIABLE RESISTORS		
VR201	EWJG2A052B15	Volume, 100kΩ (B)
VR202	EWHFKA004G15	Balance, 100kΩ (G)
VR301	EWCX9A005012	Treble
VR302	EWCXAA005C15	Bass, 100kΩ(C)
VR601, 602	EVNK6AA00B23	FL Level Meter, 2kΩ(B)
THERMISTORS		
TH301, 302	RRT104	100kΩ
COMPONENT COMBINATION		
Z401	SXRFS203ZSM	(0.01μF) x 2
FLUORESCENT DISPLAY TUBE		
FL	SADBG89Z	Power Meter
FUSES		
F1 ⚠	XBA2C10TRO	250V, T1A
F2 [XA]only ⚠	XBA2C20TRO	250V, T2A
SWITCHES		
S1	SSH3033	Input Selector
S2, 3, 4	SSH3043	Tape Monitor, Loudness
S5, 6	SSH2017	Speaker (Main/Remote)
S7	SSH1053	Range Selector
S8 other areas ⚠	SSH1057	Power Source
S8 [E, EK] ⚠	ESB822S	Power Source
S8 [EG, XA] ⚠	ESB90217S	Power Source
S9 [XA] only ⚠	ESE37219	Voltage Selector

Ref. No.	Part No.	Description & Pcs
CABINET and CHASSIS PARTS		
1	SBN1089	Knob, Bass, Treble and Balance (3)
2 ○	SYW573	Front Panel Ass'y (Silver) (1)
2 Ⓚ	SYW573–1	Front Panel Ass'y (Black) (1)
3	SBN1125	Knob, Volume (1)
4 ○	SGXUZ45E	Holder, Input Selector (Silver) (1)
4 Ⓚ	SGXUZ45KE	Holder, Input Selector (Black) (1)
5 ○	SGXUZ45E1	Holder, Tape (Silver) (1)
5 Ⓚ	SGXUZ45KE1	Holder, Tape (Black) (1)
6	SBC443	Button, Input Selector (3)
7	SBC445	Button, Tape Monitor (2)
8	SBC441	Button, Speaker, Range, Loudness (4)
9 ○	SDU131	Filter, FL (Silver) (1)
9 Ⓚ	SDU131–1	Filter, FL (Black) (1)
10	SGX7327	Holder, FL (1)
11	SBC337–1	Button, Power Source (1)
12	SMX617	Shield Cover (1)
13 other areas	SMX609	Shield Cover (1)
13 [EG,XA] only	SMX453	Shield Cover (1)
14 (Except for[EG, XA])	SJT347	Holder, Fuse (2)
15	SJJ71B	Jack, Headphone (1)
16 ○	SKC1050S1	Cabinet (Silver) (1)
16 Ⓚ	SKC1050B1	Cabinet (Black) (1)
17	SUS275	Bracket (1)
18	SMP323–1	Holder, LED (Tape) (1)
19	SMP321–1	Holder, LED (Input) (1)
20	SMX365	Shield Cover (1)
21 [EG] only	SJT347	Holder, Fuse (2)
21 [XA] only	SJT347	Holder, Fuse (4)
22 [XL] only	RJT202B	Terminal (1)
23	SML129	Bracket, Power Transformer (1)
23 [XL] only	SML129–1	Bracket, Power Transformer (1)
24	SMX615	Shield Cover (1)
25	SJF4815	Terminal Board (1)
26 other areas ⚠ **S**	SJA88	AC Cord (1)
26 [EK] ⚠	RJA45YA	AC Cord (1)
26 [XA] ⚠	SJA111	AC Cord (1)
26 [XL] ⚠ **S**	QFC1207MA	AC Cord (1)
27 other areas	SHR127	Bushing, AC Cord (1)
27 [EK] only	SHR129	Bushing, AC Cord (1)
27 [XL] only	SHR131	Bushing, AC Cord (1)
28 other areas	SGP3170B	Rear Panel (1)
28 [EK] only	SGPUZ45E	Rear Panel (1)
28 [XA] only	SGP3170–1A	Rear Panel (1)
28 [XL] only	SGP3170–2A	Rear Panel (1)
29 ⚠ [XA] only	SJS601–2	Socket (1)
30	SJF3051–3N	Terminal Board (1)
31	SHR401–1	Look Pin (1)
32	SKUUZ45E	Bottom Board (1)
33	SKL249	Foot (4)
SCREWS		
N1	XTBS3+8BFYR1	Tapping, with Detent (3)
N2 **S**	XTB3+8BFN	Tapping, ⊕ 3x8 (5)
N3 **S**	XSN3+6S	⊕ 3x6 (4)
N4 ○	SNE2095–2	Tapping (2)
N4 Ⓚ	SNE2095–3	Tapping (2)
N5 **S**	XTB4+10BFZ	Tapping, ⊕ x 10 (4)
N6 **S**	XSN3+12BNS	⊕ 3x12 (2)
N7 **S**	XTN3+8B	Tapping, ⊕ 3x8 (1)
N7 [EG] only	XTWS3+8HFZ	Tapping, ⊕ 3x8 (1)
N8 **S** [XL] only	XTB3+8BFN	Tapping, ⊕ 3x8 (1)
N9 **S** ○	XTB3+8BFN	Tapping, ⊕ 3x8 (2)
N9 **S** Ⓚ	XTB3+8BFZ	Tapping, ⊕ 3x8 (2)
N10	XTBS3+8BFZ1	Tapping, with Detent (10)
N12	XTBS3+8BFYR1	Tapping, with Detent (2)
N13 **S**	XTN3+10B	Tapping, ⊕ 3x10 (4)
WASHERS		
N14 **S**	XWA3B	Spring, ϕ3 (6)
N15 **S**	XWG3	Plain, ϕ3 (7)
N16 **S** [XL] only	XWC3B	External Toothed Lock ϕ3 (2)
N17 **S**	XWC3B	External Toothed Lock ϕ3 (2)
NUTS		
N18	SNE4021	Nut, with Plain (4)
N19 **S**	XNS12	ϕ12 (1)
ACCESSORIES		
A1 ⚠ [XA] only	SJP5213–1	Plug Adapter, (C → U) (1)
A2 ⚠ [XA] only	SJP5215	Plug Adapter, (U → B) (1)
A3 [E, EH, EB]	SQF11213	Instructions Book (1)
A3 [EG]	SQF11215	Instructions Book (1)
A3 [EK, XL]	SQF11217	Instructions Book (1)
A3 [EF]	SQF11219	Instructions Book (1)
A3 [XA]	SQF11221	Instructions Book (1)
A3 [Ei]	SQF11363	Instructions Book (1)
PACKING PARTS		
P1 ○	SPP699	Polyethylene Bag (Silver) (1)
P1 Ⓚ	SPP649	Polyethylene Bag (Black) (1)
P2 other areas	SPS3661–2	Pad, Left Side (1)
P2 [XL] only	SPS3661–1	Pad, Left Side (1)
P3 other areas	SPS3663	Pad, Right Side (1)
P3 [XL] only	SPS3663–1	Pad, Right Side (1)
P4 other areas ○	SPG3895	Carton Box (Silver) (1)
P4 [EF] ○	SPG3897	Carton Box (Silver) (1)
P4 [Ei] ○	SPG3899	Carton Box (Silver) (1)
P4 [XL] ○	SPG3901	Carton Box (Silver) (1)
P4 [E] Ⓚ	SPG3991	Carton Box (Black) (1)
P4 [EG] Ⓚ	SPG3993	Carton Box (Black) (1)
P4 [EH, Ei] Ⓚ	SPG3995	Carton Box (Black) (1)

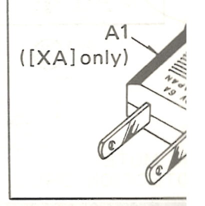
EXPLODED VIEW

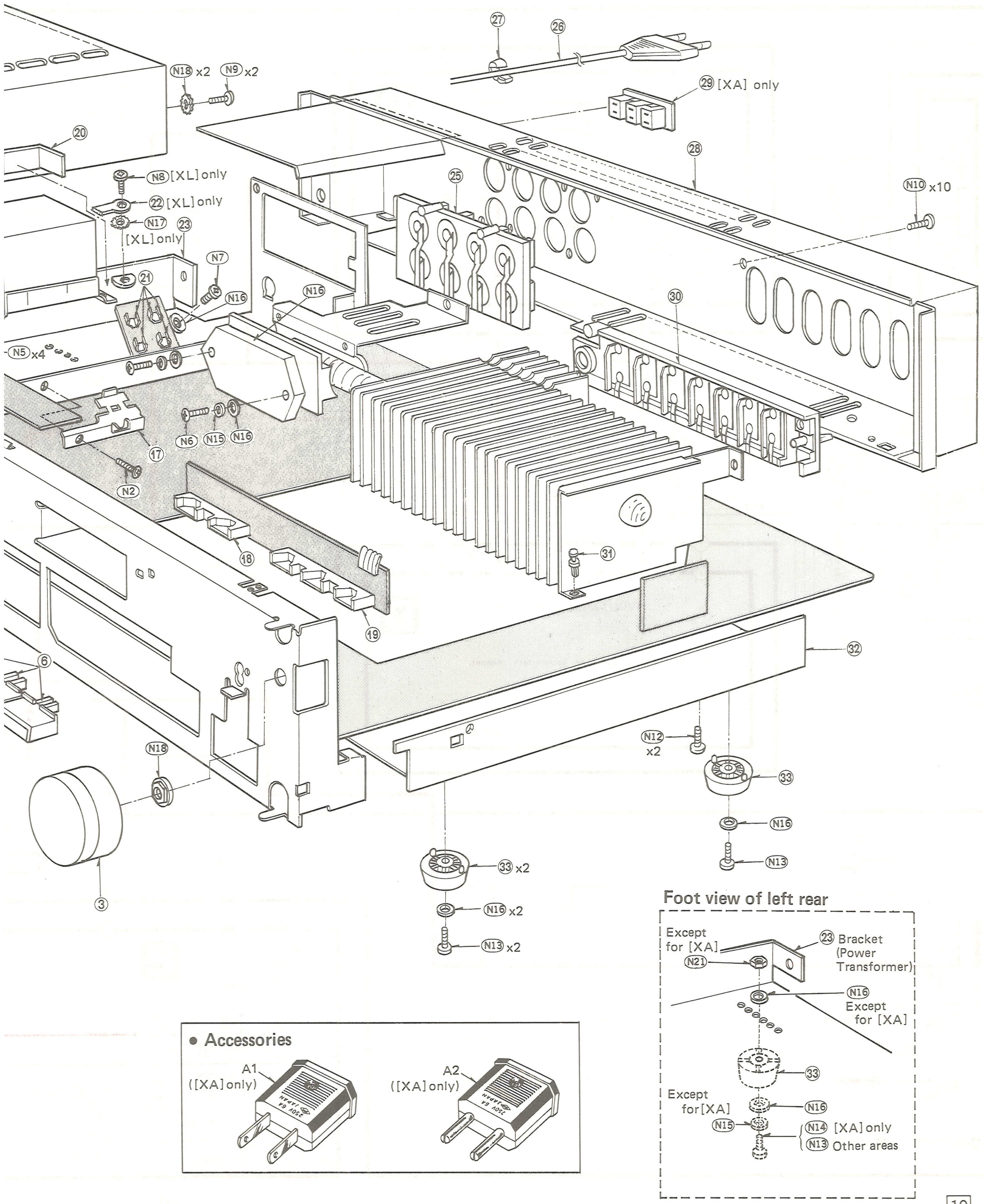


Areas

- * [E] is available in Scandinavia and Switzerland.
- * [EG] is available in F.R. Germany.
- * [EK] is available in United Kingdom.
- * [EF] is available in France.
- * [EH] is available in Holland.
- * [EB] is available in Belgium.
- * [Ei] is available in Italy.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XL] is available in Australia.

● Accessories





Foot view of left rear

- Accessories

RESISTORS & CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	G : ± 2%
ERG : Metal Oxide	25 : 1/4W	J : ± 5%
ERO : Metal Film	1 : 1W	
	S1 : 1/2W	

ERD10TLJ□□□ → Chip type carbon
ERO10MKG□□□ → Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	103	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	C : ± 0.25pF
ECEA. . . N : Non Polar Electrolytic	1C : 16V	2H : 500V DC	J : ± 5%
ECCD : Ceramic	1E : 25V	MY : 125V AC	K : ± 10%
ECKD : Ceramic	1V : 35V	KC : 400VAC	M : ±20%
ECQM : Polyester	1H : 50V	2A : 250VAC	Z : +80%, –20%
ECQE : Polyester	1J : 63V		P : +100%, –0%
ECET : Electrolytic	50 : 50V		
	25 : 25V		
	2A : 100V		

Ref. No.	Part No.	Value
RESISTORS		
R1, 2	ERD10TLJ391U	390
R3, 4	ERO10MKG2213	221K
R5, 6	ERO10MKG5622	56.2K
R7, 8	ERD10TLJ271U	270
R9, 10	ERD10TLJ680U	68
R11, 12	ERD10TLJ184U	180K
R13, 14	ERD10TLJ123U	12K
R15, 16	ERD10TLJ563U	56K
R17, 18	ERD10TLJ102U	1K
(R21)x2	ERD10TLJ102U	1K
(R22)x2	ERD10TLJ124U	120K
(R23)x2	ERD10TLJ393U	39K
(R24)x2	ERD10TLJ823U	82K
(R25)x2	ERD10TLJ561U	560
(R28)x2	ERD10TLJ681U	680
R41	ERD10TLJ124U	120K
R42	ERD10TLJ563U	56K
R43	ERD10TLJ471U	470
R44	ERD10TLJ103U	10K
R45	ERD10TLJ222U	2.2K
R46	ERD10TLJ473U	47K
R48	ERD10TLJ562U	5.6K
R56	ERD10TLJ333U	33K
R101, 102 **S** (for [EG] only)	ERD25FJ391	390
R103, 104 **S** (for [EG] only)	ERD25FJ272	2.7K
R105~112 **S** (for [EG] only)	ERD25FJ102	1K
R151 **S** (Except for [EG])	ERD25FJ100	10
R153, 154 **S**	ERD25FJ101	100
R201, 202 **S** (Except for [EG])	ERD25FJ272	2.7K
R201, 202 **S** (for [EG] only)	ERD25FJ222	2.2K
R203, 204 **S**	ERD25TJ223	22K
R205, 206 **S**	ERD25TJ473	47K
R301, 302 **S**	ERD25FJ122	1.2K
R303, 304 **S**	ERD25TJ824	820K
R305, 306 **S**	ERD25TJ223	22K
R307, 308 **S**	ERD25FJ392	3.9K
R309, 310 **S**	ERD25TJ683	68K
R311, 312 **S**	ERD25FJ392	3.9K
R313, 314 ⚠ **S**	ERD25FJ470	47
R315 ⚠ **S**	ERD25FJ470	47
R316 **S**	ERG1ANJ152	1.5K
R317, 318 **S**	ERD25FJ272	2.7K
R319, 320 **S**	ERD25FJ222	2.2K
R321, 322 ⚠	ERDS1FJ100	10
R323, 324 **S**	ERG1ANJ331	330
R410, 402 ⚠	ERDS1FJ152	1.5K
R403, 404 **S**	ERD25TJ153	15K
R406, 407 **S**	ERD25FJ151	150
R411 **S**	ERG1ANJ152	1.5K
R414 ⚠ **S**	ERD25FJ390	39
R415 ⚠ **S**	ERD25FJ470	47
R416 **S**	ERD25TJ274	270K
R417 **S**	ERD25FJ122	1.2K
R601, 602 **S**	ERD25FJ682	6.8K
R603, 604 **S**	ERD25FJ821	820
R605, 606 **S**	ERD25TJ223	22K
R607 ⚠	ERDS1FJ271	270
R608 ⚠ **S**	ERD25FJ561	560
R609 **S**	ERD25FJ472	4.7K
R610 ⚠	ERDS1FJ151	150
R611 **S**	ERD25FJ471	470
R612 ⚠	ERDS1FJ391	390
CAPACITORS		
C1, 2 **S**	ECEA50M3R3R	3.3
C3, 4 **S**	ECCD1H101KC	100P
C5, 6 **S**	ECKD1H471KB	470P
C7, 8 **S**	ECQM1H223JZ	0.022
C9, 10 **S**	ECQM1H682JZ	0.0068
C11, 12 ⚠	ECEA1HN010S	1
C13, 14 **S**	ECEA1CS330,	33
(C21)x2 **S**	ECEA50Z3R3	3.3
(C22)x2 **S**	ECCD1H390KC	39P
(C23)x2 **S**	ECEA1HS100	10
(C24)x2 **S**	ECEA25Z4R7	4.7
(C28)x2 **S**	ECCD1H820K	82P
(C29)x2 **S**	ECCD1H030CC	3P
(C30)x2 **S**	ECCD1H330KC	33P
(C31)x2 **S**	ECCD1H391KB	390P
C41 **S**	ECEA1JS330	33
C42, 43 **S**	ECEA1HS470	47
C44 **S**	ECEA2AS3R3	3.3
C101, 102 **S** (for [EG] only)	ECCD1H180KC	18P
C201, 202 **S**	ECQM1H563JZ	0.056
C203, 204 **S** (Except for [EG])	ECKD1H471KB	470P
C221 ~ 228 **S** (for [EG] only)	ECKD1H471KB	470P
C301, 302 **S**	ECQM1H223JZ	0.022
C303, 304 **S**	ECQM1H183JZ	0.018
C305, 306 **S**	ECQM1H104JZ	0.1
C307 **S**	ECEA1HS101	100
C308 **S**	ECKD1H103ZF	0.01
C311, 312 **S**	ECCD1H101KC	100P
C313, 314 **S**	ECCD1H101KC	100P
C315, 316 **S**	ECEA1HS470	47
C317, 318 ⚠	ECEA1EN3R3S	3.3
C319, 320 **S**	ECQM1H473JZ	0.047
C321~324 **S** (for [EG] only)	ECKD1H103ZF	0.01
C325, 326 **S** (for [EG] only)	ECKD1H333ZF	0.033
C391, 392 (for [EG] only)	ECQM1H124KZ	0.12
C393 **S** (for [EG] only)	ECKD1H333ZF	0.033
C401, 402	ECETS45V682U	6800
C403 **S**	ECEA1AS331	330
C404 **S**	ECEA2AS100	10
C407, 408 **S**	ECEA1ES101	100
C409, 410 **S**	ECKD1H103ZF	0.01
C501 ⚠ (Except for [EG] & [XA])	ECKDKC103PF	0.01
C502 ⚠ [for [EF] only)	ECQE2A473MW	0.047
C503~506 ⚠ (for [EG] only)	ECKDKC222MF	0.0022
C507 ⚠ (for [EG] only)	ECQE2A473MW	0.047
C508, 509 ⚠ (for [EG] & [XA] only)	ECKDKC103PF	0.01
C601, 602 **S**	ECEA50ZR47	0.47
C603 **S**	ECEA50ZR47	0.47
C604 **S**	ECKD1H103ZF	0.01
C605, 606 **S**	ECKD1H332KB	0.0033
C609 **S**	ECEA1VS330	33

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